

Harley D. Rutledge, Ph.D.

PROJECTIFICATION

THE FIRST SCIENTIFIC FIELD STUDY
OF UFO PHENOMENA



PROJECT IDENTI- FICATION

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FIELD STUDY OF
UFO PHENOMENA**

Harley D. Rutledge, Ph.D.

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by Harley D. Rutledge, Ph.D.
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This book is dedicated to the memory of Reggie Bone, head basketball coach at Clearwater High School in Piedmont, Missouri, from 1965 to 1974 when he was forced to relinquish his duties because of the debilitating effect of amyotrophic lateral sclerosis. He learned of his disease in the fall of 1972, about six months before he and five of his basketball players first saw a UFO in the area. Although he did not seek the publicity that made him somewhat of a media personality—the interviews, the telephone calls, the visitors—all the attention helped to sustain him until his death at age 48 on April 5, 1977.

The above is a list of the names of the persons who have been appointed to the various committees of the Board of Directors of the American Telephone and Telegraph Company, for the year ending December 31, 1914.

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THE PIEDMONT UFO FLAP

In late February and March 1973, strange events were being reported in the area of Piedmont, Missouri. For example, there were reports that cars had become stalled on highways when a light had flown nearby or when a light had beamed down from above. Usually, the car radio ceased to function, too. Interference with television signals was reported not only in the Piedmont area but in nearby towns as well. After the picture had become scrambled and the sound garbled, people would step outside and see a silent ball of light come floating over; sometimes the yard lights went out, too.

On one occasion, the police radio system stopped working. According to Dennis Hovis, manager of radio station KPWB, the transmitter was "knocked out" the same night. Hovis and others had seen a lighted object pass directly over the radio transmitter tower. On another occasion, a man reported that he not only lost his television signal but that his lights dimmed and his house shook. Stepping outside, he saw an egg-shaped object hovering nearby that emitted a high-pitched sound. His dogs had run away to hide. There were other reports of lights that made erratic turns, or went off when aircraft approached. There were even reports of flying saucers, of objects sitting on the ground in fields, and of objects moving *underwater* in Clearwater Lake. Clearly, "the Piedmont UFO," as Hovis termed it on his newscast, had arrived.

In March, media persons, sightseers, thrill seekers, relatives of Piedmonters, kooks, ufologists, pseudoscientists, and even a scientist or two came from all over the country to see the spectacle.

Hundreds of cars lined country roads or occupied Pyle's Mountain. Some nights, more than 300 cars were parked at Clearwater Dam. The roadsides at Brushy Creek were also full. A few persons drove from location to location as messengers, making inquiries and transmitting information from other viewing sites. But once the adults came to look, the high school crowd became bored with nocturnal UFO watches. They could no longer chase after the fast-moving UFOs in their cars because roads were clogged with traffic, and roadsides were crowded with people scanning the sky.

The nightly ritual was well covered by metropolitan newspapers and television stations. Some of the articles were sarcastic, almost acerbic; others portrayed Piedmont residents as uncultured and lacking in table manners. A few reporters suggested that the UFO stories were nothing more than a scheme to stimulate the local economy. And indeed, many of the town's two thousand residents derived their income from ownership of motels, trailer parks, and boatdocks. Clearwater Dam, completed by the Corps of Engineers in 1948, provided a lake that is a perennial attraction to vacationers. Clear streams abounded for fishing, and forests were ideal for hunting. Main Street was lined with small shops and businesses, among them Toney's Drugstore, where people met to swap stories. (But not all businesses depended on the tourist trade. Three large sawmills and a couple of quarries were in the area. The Brown Shoe Company had a factory at the northeast edge of town, where State Routes 34 and 49 merge to become Main Street, next to McKenzie Creek.)

Mayor Roy Anderson stated, "The reports of unusual sightings hereabout shouldn't have any ill effects on the town." To the contrary, he said, "We're a resort town, and if people come here, they leave some money here." Police Chief Gene Bearden agreed: "Something like this helps the economy of Piedmont."¹

The Chamber of Commerce of a nearby town good-naturedly beseeched the UFOs to visit them so that their economy would be stimulated. Most reporters tried to be factual, but wrote in a manner that betrayed their undercurrent of skepticism.

I learned that many Piedmont residents were perplexed not only by the antics of the UFOs but by the intense media coverage. Much tension and excitement pervaded the area. Newspapers reported that frightened women in rural areas were carrying firearms at night. Residents of the Clark Mountain Rest Home had been alarmed by a lighted object that hovered nearby. And self-proclaimed ufologists arrived, purporting to make a scientific study with the

most modern and sophisticated equipment: a small pocket compass, cheap tape recorder, and a CB radio!

A man from one amateur UFO organization claimed over radio station KPWB that UFOs were of extraterrestrial origin. He lent credence to the rumor that Clearwater Lake was a large UFO base by hiring divers to look for evidence. After reassuring people that UFOs posed no physical threat, he negated this statement by saying that UFOs had destroyed Air Force jets in aerial combat. Actually, his purpose was to collect a few hundred UFO reports that he could publish in sensational weekly tabloids.

In March, during a television network interview, Maude Jefferis displayed some of her UFO photographs. The next morning, two of my colleagues made the tongue-in-cheek suggestion that I should investigate the Piedmont UFOs. I laughed and responded: "I wouldn't touch that with a ten-foot pole!" Less than two weeks later, I would change my mind completely.

This was my tenth year at Southeast Missouri State University at Cape Girardeau, the last nine as chairman of the Physics Department. My Ph.D. degree had been in the area of solid state physics; in particular, photoelectric emission from the chemical compound strontium oxide. Having just completed two years of service to the Missouri Academy of Science as vice-president and president, I was preparing to collaborate with a colleague in research on the electron emission properties of thin films of tin oxide.

Although I had always maintained a skeptical attitude about the existence of UFOs, the hallmark of all scientists is their curiosity. My own curiosity about UFOs dated from the early fifties when I read a couple of books by Major Donald Keyhoe: *Flying Saucers From Outer Space* (1953) and *The Flying Saucers Are Real* (1960). In the late sixties, I read a few other books, including the much-heralded and voluminous *Scientific Study of Unidentified Flying Objects* (1969),² usually referred to as the Colorado Report or the Condon Report. The book is a summary of a study made at the University of Colorado, funded by the Air Force, and directed by Dr. E. U. Condon, a no-nonsense physicist who was well respected in the scientific community. The thrust of the study was to investigate UFO reports, not the UFOs themselves, even though field investigation teams were assembled for the latter purpose. In my opinion, the field investigation scheme failed because the program administrators did not recognize the need for observation stations in the field. Instead, the teams responded to reports of sightings in progress, always arriving too late on the scene.

In 1967, a short-lived UFO "flap"—a local outbreak of UFO sightings—occurred in southeast Missouri. The sightings were reported in the January 16, 18, 19, and 21 editions of the Cape Girardeau *Southeast Missourian*. My reaction was only a mild interest, and I instantly refused a friend's invitation to go UFO watching. A scientist wouldn't jeopardize his career in that manner. I soon forgot about it. But in 1973, after I had become publicly involved in UFO research, several faculty members told me privately that during the 1967 flap, they had seen peculiar lighted objects at night in the sky over Illinois across the Mississippi River from Cape.

In March 1973, as more and more UFO reports poured out of Piedmont, my interest increased, in spite of my original skepticism about the UFO enigma. But my decision to become actively involved did not come easily. Because it would mean placing my career in jeopardy, I vacillated as to whether I should become publicly involved with the UFO phenomenon, pondering the ramifications for more than a week.

Finally, being somewhat of a closet iconoclast, I decided to satisfy my curiosity. After all, the phenomenon was only seventy-five miles away! Wisely, I involved a few of my colleagues from the Department of Physics. I persuaded Milton Ueleke, then astronomy instructor, to go along for an initial look.

Ueleke was an excellent choice, a man in good standing in the community. Born and reared in Cape Girardeau, he had attended local Cape schools and graduated from the University, then taught high school at Dexter until World War II. As a navigator on a B-24 bomber, Lieutenant Ueleke had experienced aerial combat. After the war, he had returned to Cape, married a local girl, and taught physics at Central High School for nineteen years. He had been hired by the University because of his maturity and reputation as a teacher.

I then informed Dr. Mark Scully, then president of the University, via a memorandum, that a few colleagues and I were going to Piedmont to investigate. In order to avoid a negative response, I hadn't couched my statement in the form of a request:

To: President Mark Scully
From: Harley D. Rutledge

March 27, 1973

After a bit of soul searching and discussion with colleagues, some of us in the department of physics have decided to investigate the strange lights appearing in the sky around Piedmont, Missouri. We plan to go as a team of scientists from the University, limited to me, Dr.

Sidney Hodges, Prof. Milton Ueleke, and two students. The students are John Wilson and King Turnbull.

Tentatively, we plan to take scientific recording instruments to the locale with the purpose of obtaining data, if we are fortunate. The instruments include several astronomical telescopes rigged with cameras or light-sensing devices, a magnetometer, sound recorders, radios, and binoculars.

As a matter of courtesy, I am informing you of our plans, as there may be publicity involving us as University representatives.

One reporter, Bill Clark of the *Detroit News*, was an avowed skeptic when he arrived in Piedmont on March 27 but not when he left, according to Maude Jefferis, local professional photographer and high school photography teacher. The night of his arrival he accompanied Hovis and Jefferis to isolated Millers High Point not far from the Brushy Creek area. They observed many white and multicolored lights making frequent trips in the sky between Brushy Creek and Clearwater Lake. Clark was impressed. (He would visit Missouri again in late November, when he came to Cape Girardeau to interview me for a total of nine hours. He was exceedingly thorough and fair. His story, one of the most factual ever written about Project Identification, appeared on the front page of the Sunday *Detroit News* on December 2, 1973.)

The weekend of March 31, a bona fide scientist and his assistant who came to Piedmont were not very impressed. Dr. J. Allen Hynek, then chairman of Northwestern University's Astronomy Department and a former scientific consultant on UFOs to the Air Force, was invited to Piedmont by State Representative Jerry T. Howard at the request of Police Chief Gene Bearden. Hynek said that their brief visit turned up only "very uninteresting stuff." "We ourselves didn't see anything, but that's to be expected," he said. "But we found a great number of highly excited people..." He pointed out that the power of suggestion is so great that people thought they were seeing UFOs, which were actually just distant pulsating lights, probably from observation towers. "You have to disregard any light on the horizon," he said. He added, however, that not all evidence in Piedmont was negative: "...neither of us can punch any holes in the story of the basketball coach." He was speaking of Reggie Bone.³

No one in Piedmont doubted the word of Coach Bone, probably the best-known and most popular person in the area. In south-east Missouri, basketball coaches are idolized, especially if they

have winning seasons. Bone, a native of the area, was no exception. In early 1973, he was completing his eighth year as coach of the Clearwater High School Tigers. For a month or so following his sighting, Bone's name appeared frequently in worldwide media reports.

On the night of February 21, Bone and five of his basketball players had been driving home from a tournament at Dexter. "We were coming back by way of Route 60," he later related. "I might add here that this was the first place that we saw it . . . about a mile and a half from where you turn off to go to Ellsinore. We just happened to glance in the tree line over there. Some of the boys were talking and I asked one if he could see it. At the time we more or less passed it off as an airplane, although I did glance back over there and thought to myself: This thing is not moving. But, oh, well, we're moving, probably driving the speed limit. It is an airplane.

"It was a real dark night, about two hours before the moon had come up. The thing was in the tree line. The only thing we could see was a rotation of lights. The lights were red, green, amber, and white. A light came down from it. This wasn't the workings of any aircraft I had seen before.

"When we turned off Route 60, we had forgotten the matter really. We came over Brushy Creek and up Ijames Hill [*sic*] and started down Ijames Hill. One of the kids in the car, I can't recall exactly who, said, 'There's that thing we saw over on Highway 60 sitting out in the field.'

"So we did stop, sure enough, and I looked over there. It's hard to judge at night, but I would say the object was less than two hundred yards away. It looked fairly close and a little weird, I might say. Here was this object that appeared to be some fifty feet up off the ground with the same light rotation, the same pattern that we observed on 60 on the first time we saw it."⁴

After Bone stopped the car, all got out to observe the silent, hovering craft. Bone said that the row of colored lights looked like portholes. They could not discern the shape of the craft. About ten minutes later, the configuration rose silently at an angle and disappeared over a ridge. The group jumped into the car to follow, hoping to see the object pass over Mill Spring, where the city lights might reflect off the object, revealing its shape.

Despite Bone's admonition to his players, the event was later reported worldwide by the media, and Piedmont was "on the map." Starting the next night after the Bone sighting in the Brushy Creek area, a series of sightings originated there and elsewhere.

I learned of the Bone sighting and other events at Piedmont through media sources as well as from students who commuted daily to the University. Two University students, Ron Miller of Piedmont and Joe King of Mill Springs, came to my office one day to relate a story difficult for me to believe. On their way home on March 22, they had observed a silvery disc. Sunlight reflected off the disc as it flew, tilted slightly forward in the direction of motion, at treetop level over a farm near Patterson. They were so shocked they didn't stop their car to watch. Both students were seniors, both were in their early thirties and obviously sincere. Nonetheless, I could not accept their story as true; but neither could I accuse them of lying. Besides, they were in no mood to have their integrity questioned; they had been ridiculed enough by friends and acquaintances.

In making preparations to become involved at Piedmont, I telephoned Chief Bearden. His statements to the media had been honest and forthright. Obviously, he was a man with a level head, and in his position of authority, he would be a good man to know. I told him that scientists from the University wanted to look at the situation at Piedmont. His response surprised me: "Well, uh . . . I don't know. We've had enough people in here looking around already. We don't want any more of that!"

I knew what he meant. I assured him that we, like him, were from Missouri, that we were practically neighbors. Students from Piedmont attended the University; we would make friends and would not embarrass anyone. He was particularly impressed when I mentioned names of persons in Piedmont who were known to me or Ueleke. He immediately reversed his stance and was eager for us to come.

My involvement began six weeks after the Bone sighting. Ueleke and I and our wives drove to Piedmont on Friday afternoon, April 6, to learn firsthand what was happening there. After we crossed U.S. Route 67, we were in the St. Francois Mountains—UFO country. Another fifteen miles and we came to the eastern portion of Piedmont. Just before turning onto Main Street, we saw the Waltrip Motel. On the marquee was the message "WELCOME UFO PEOPLE," while the opposite side proclaimed "PIEDMONT IS UFO HEADQUARTERS." Photographs of the marquee had appeared in newspapers. We continued across town on Main Street until we came to an A-frame structure with "KPWB 1140 KILOCYCLES" on its slanted roof.

As we entered I noticed that the clock in the small broadcast studio read 5:30. Smiling, a husky, light-haired man in his early

thirties rose to greet us. "Are you Dr. Rutledge from Cape Girardeau?" he asked. Chief Bearden had told him that we were coming.

"Yes, I am," I replied.

"I'm Dennis Hovis. It's a pleasure to meet you, sir."

I introduced Ueleke and then our wives. Ueleke and I seated ourselves near Hovis, who began to relate accounts of some of the more important sightings, starting with the much-publicized Bone report. Hovis, as I learned later, was very well liked. Most people in the area had reported their sightings to him at the radio station. During our interview, he was interrupted a couple of times to listen to UFO reports that listeners were phoning in. The calls lent a strangeness to our visit. Obviously, the radio station was the real "Piedmont UFO Headquarters."

After Hovis finished his report to us, he asked if we planned to visit Maude Jefferis to inspect her photographs. Apparently this was a ritual for all visiting dignitaries who professed a genuine interest in UFOs. His esteem for Mrs. Jefferis was evident.

The telephone rang again, and Hovis rushed to answer. When the conversation concluded, he said excitedly, "There's been a UFO landing on Clark's Mountain! This high school boy just called about it. His parents saw it too, and they are reliable. Why don't we go out there? It's only a couple of miles the other side of Piedmont. You came by it on the way in."

After agreeing, I nodded at Ueleke and winked. His answering grin assured me that he too believed the report was somewhat far-fetched. When we got into the car, I said, "Milton, this could be a big put-on for our benefit." He agreed.

East of the city we came to a dirt road where we turned north toward Clark Mountain. Immediately, someone in a pickup hailed Hovis to a stop. The driver said that he had not seen anything suspicious. He did suggest that a local pilot named Don Casey had flown over Clark Mountain with his landing lights on, and after dropping down the other side, had switched them off. This could have given the appearance of an aerial vehicle landing on the mountain. Hovis thought the driver's suggestion seemed a plausible explanation for the boy's report, so he returned to the radio station while we went to dinner in Piedmont with Mr. and Mrs. Glenn Hibbard, friends of the Uelekes. The Hibbards would serve as our guides for the evening.

After dinner, we went to Pyle's Mountain, where we stood and peered into the semidarkness.

NOTES:

1. *St. Louis Post-Dispatch*, April 1, 1973, p. 10 F.
2. Edward U. Condon, *Scientific Study of Unidentified Flying Objects* (New York: E. P. Dutton, 1969). Hereafter referred to as "Condon Report."
3. *St. Louis Globe-Democrat*, April 2, 1973.
4. From an audiotape recorded June 1, 1973.

2

OBSERVATIONS DURING INITIAL FIELD INVESTIGATIONS

Even before our first trip to Piedmont, my colleagues in the Department of Physics agreed that any involvement there should be on a scientific basis, using instrumentation. If data could be collected, it would be catalogued and used later to compare and contrast different sightings. Although the purpose of the first trip that Ueleke and I made, on April 6, 1973, was to ascertain the feasibility of a scientific study, data from five observations were obtained that night, assuring a continuation of the investigation.

After reaching Pyle's Mountain, I found a concrete slab in the semidarkness that would serve as a firm base for our Questar telescope, mounted on a sturdy Davis and Sanford tripod. Unlike most telescopes, the Questar telescope's magnifying power can be changed without replacing the eyepiece lens (the lens closer to the eye when looking through the telescope) with another of a different focal length. The focal length of a lens, like that of a magnifying glass used to focus sunlight, is the distance between the lens and the point where a small, clear image of the sun appears. After each lever change, the telescope must be refocused—a time-consuming process, depending on the skill of the operator.

Magnifying power determines the size of the image seen in a telescope. The term is also used in describing binoculars which, in reality, are two telescopes side by side. Typical values of magnifying power for binoculars are 6X, 7X, 10X, and even 20X. For telescopes, the magnifying power can be still larger. The Questar starts with a magnifying power of 8, designated 8X. This means that a distant object will appear to be eight times as close—or, to put it another way, will appear eight times larger through the telescope. The 8X setting is used for finding and focusing on an object. The next step is a lever change, along with some refocusing, to get the telescope on 80X. This can be followed by another lever change and adjustment to 160X, if desired.

Less than an hour had elapsed on Pyle's Mountain when a small stationary light suddenly appeared near the southern horizon. After locating and centering the light in the telescope on 8X, I attempted to view the light on a higher power, but before I could focus properly, the light went out. It had been visible for about five seconds.

At intervals of several minutes, the light appeared three more times, but in a different position on each occasion. First it appeared to the left of the original position; then to the right; then back to the original azimuth but closer to our position. On its fifth and final appearance, the light was at its original distance and azimuth but higher in the sky, about halfway between the horizon and the overcast. This time the light was visible for about twenty seconds, allowing me to view it on 80X. Even then, it appeared as just a stationary ball of light. When the light went out it didn't switch off instantaneously but decayed, in about two seconds. I was reminded of powerful 1000-watt bulbs with tungsten filaments used to illuminate athletic fields at night. The filament, having a relatively large thermal mass because of its size, cools rather slowly when the electric current is switched off. During my last observation, the brightness of the light appeared to flicker somewhat. After the last sighting, we left for the Brushy Creek area, where many sightings had been reported. Not seeing anything unusual by 11 P.M., we went to the Hibbards for doughnuts and coffee.

Apparently we should have stayed at Pyle's Mountain. Leo Dougherty and Teresa Wulfers of Cape Girardeau arrived at the mountain at about 10:15 P.M., after we had left for Brushy Creek. At 10:30, they observed a small light near the horizon, moving from right to left. Other people present said, "That's it!" After about ten seconds, it brightened for five seconds and faded from view. At 1:00 A.M., a light repeated the sequence at the same azimuth, fading out in about fifteen or twenty seconds.

Well after midnight, we left the Hibbard residence and started home. Our conversation soon led to a discussion of our observations from Pyle's Mountain. On five occasions within two hours, we had observed a light hovering in the distance. The five sightings did not convince me that UFOs existed, but they were peculiar, and they certainly aroused my interest.

Ueleke insisted that we had seen automobile headlamps. Although Ueleke taught astronomy at the university he had not viewed the lights through a telescope or binoculars. Not for a moment did I accept them as car headlights, nor did our wives. My only recourse was to make calculations which would later prove to Ueleke that he was wrong.

How far away can two lights, four feet apart, be seen (resolved) as two lights; that is, before the two lights appear to overlap?

Resolution is a measure of an optical device's capacity (simple magnifying glass, camera, microscope, telescope, or eye) to distinguish separate images of different objects; i.e., to "see" detail. For example, some telescopes "see" small craters on the moon that other telescopes cannot. As another example of resolution, look at the two black spots in Fig. 2.1. Now, while looking at the spots under good illumination, move away until they can no longer be distinguished as two separate spots. The angle subtended at the eye (Fig. 2.2) is approximately the minimum angle of resolution of the eye.¹



Fig. 2-1 Two spots that can be used to test the resolution of the eye



Fig. 2-2 Measurement of the angle A of resolution of the eye

Starting with the telescope, or binoculars, what is the most important factor affecting resolution? Stars, being at prodigious distances from earth, are true point-sources of light—but are not *seen* as point sources. In a telescope, the image of a star is a bright circle caused by the diffraction (bending) of light at the aperture (objective lens or mirror). The size of the circular diffraction image depends on the diameter of the aperture: the larger the aperture, the smaller the image circle—meaning better resolution. Usually, the resolution is stated in terms of the angle (Fig. 2.3), subtended at the aperture by the diffraction image,²

$$\text{ANGLE } A = 1.22\lambda/D$$

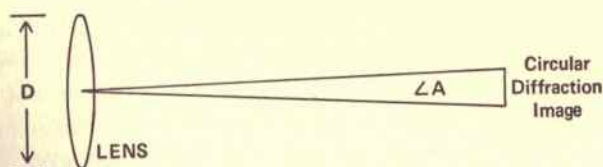


Fig. 2-3 Diffraction image of a star produced by a telescope lens

where D is the diameter of the aperture lens or mirror and λ is the wavelength of light. Note that the resolution for the longer wavelengths of red light is not as small as for the shorter wavelengths of the blue light at the other end of the visible spectrum, but also that they differ by a factor less than two.

If two stars appear to be close in the sky, their diffraction images in a particular telescope may or may not overlap, as shown in Figs. 2.4b and 2.4c. The limit of resolution (smallest angle for which the image of two stars can be ascertained) is defined as the angle subtended when the two images half-overlap, as in Fig. 2.4c.

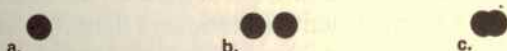


Fig. 2-4 Diffraction images of stars in a telescope: (a) single star, (b) double star where images do not overlap, (c) double star where images do overlap

The same theory applies to the viewing of stars with the naked eye. Diffraction of light at the pupil of the eye produces diffraction images of stars on the retina. For the human eye, the diameter of the pupil varies from about 2 mm in daylight to almost 8 mm in the dark. But the better resolution resulting from the larger aperture diameter is more than offset because of the eyes' poor physiological response under conditions of low illumination.³

The resolutions of telescopes and binoculars are far better than that of the human eye. For example, look at the two stars, Alcor and Mizar, in the bend of the handle of the Big Dipper, using binoculars. Then look at the same stars with your naked eye. Are they resolved? The American Indians used this pair of stars, separated by an angle of about 12 minutes, as a test for good vision.

The angular resolution of the eye has been stated to be no less than $1/16^\circ$ (3.75 minutes).⁴ (One minute is $1/60$ degree.) For the five sightings a light in the sky was viewed through a Questar telescope. The angle of resolution of the Questar, given by the manufacturer, is about 1.4 seconds of angle. In the calculation, however, I have assumed that the resolution of my eye is no better

than 5 minutes of angle, 215 times that of the Questar telescope. Hence, the telescope was not a limiting factor in whether two lights were present and resolved. With this, calculations show that the car headlamps Ueleke maintained he saw would be distinguishable as two lights up to 0.52 mile, viewed with the naked eye. Using a simplified approach, I multiplied the distance by 80, the power of the telescope, to obtain a distance of about 40 miles. This means that car headlamps, as seen through the Questar telescope on 80X, would appear as two lights—not as the single ball of light that I observed—unless the headlamps were more than 40 miles away.

Although it is nearly impossible to judge the distance to a light in *total* darkness, my estimated value of ten to fifteen miles fell well within the forty-mile maximum. But I was not observing in total darkness; I had visual cues. For instance, the terrain received some illumination by scattered ambient sky light arising from yard lights, city lights, and car headlamps as primary sources. The tops of ridges were easy to make out. In addition, there was another important visual cue, a small area of illumination or glow on the overcast arising from the lights of a town. When the stationary light first switched on, it was close to the glow on the overcast. In fact, I wondered if anyone in the town could see the stationary light. I judged the stationary light to be the same distance away as the town whose lights reflected from the overcast. Later, I learned that the town was Ellsinore, near U.S. Route 60, about seventeen miles south of our position. I concluded that the stationary light had indeed been a single ball.

Ueleke was not convinced by my calculation; he continued to insist that we had been viewing automobile headlamps. That was not the last time I would encounter persistent skepticism.

Although I did not accept Ueleke's hypothesis of car headlamps, his was a rational explanation that could be checked by experiment. Consequently, I planned an attempt to reproduce the sightings by observing headlamps of a moving vehicle on a distant mountaintop at night. The driver of the vehicle would maintain radio contact with us on Pyle's Mountain. If two lights were observed, surely Ueleke would be convinced that none of the lights I had observed were automobile headlamps—that each of my observations had been of a single light. The task was to find a road on a mountaintop.

The following Thursday, I flew with Drake Kambitch, a University student majoring in physics, to Piedmont in a Cessna 150. After arriving over Pyle's Mountain, our departure point for the search, we flew south. Seventeen miles later, we crossed U.S. Route

60. On our left was Ellsinore, about a mile north of Route 60. It was then that I concluded that this was the town whose lights reflected off the overcast the previous Friday night. Because of intervening terrain, the lights of the town could not be seen directly from Pyle's Mountain.

"Dr. Rutledge, do you want to search south of the highway?"

Drake asked. "We're about eighteen miles from Piedmont."

"Yes," I replied, "let's keep going since we're here. Those lights I saw last Friday night seemed to be ten to twenty miles away, although it's difficult to say, if the size of the light isn't known."

Eventually we located an old, unused logger's road that made a semblance of a hairpin turn atop a flat ridge. Small trees bordered the road, although they had not yet acquired their spring foliage. Having found our prescribed road, so that the experiment could be carried out, we flew back to Piedmont, landing on the dirt-strip airport. We spent the rest of the afternoon visiting with Hovis.

When we took off, darkness was setting in. Our flight path took us directly over the town as we headed for outlying areas. Less than an hour later, we were southeast of Piedmont at 2,500 feet and heading west. On my right I could see the lights of Piedmont as well as the form of Clark Mountain looming in the darkness.

Suddenly an amber—almost orange—light appeared on the slope of the mountain near the top. Seeing the light, Drake made an immediate turn to approach it. Within seconds, the light went off, and simultaneously, an identical light came on to our right, about seven ridges away. Drake banked to the right, and I began observing through binoculars. The light appeared to be very close to the earth's surface, possibly on it. A slight to-and-fro motion of the light reminded me of the undulations of the wings of a perched butterfly in a slight breeze. Suddenly, as we flew toward the light, it shot straight up! In my 10X binoculars, I could make out red and green as well as original orange in the streak.

For an instant, I thought that despite the fact that our flight was smooth and level, I had possibly caused some motion of the binoculars to produce the effect of a moving light. That rational explanation was rejected a moment later when Drake shouted over the engine noise, "Did you see that damned thing shoot straight up into the sky?"

We discussed our observation for several minutes. "Drake," I finally said, "we won't label this a UFO sighting, but we'll just describe it as we saw it." He said that the light faded out as it rose, an effect he did not attribute to its increasing distance from our

aircraft. Subsequent experiences have led me to believe that we did observe a bona fide UFO, Class A.

Drake, observing with the naked eye, could see the entire flight upward, while my view was restricted to seven degrees in the binocular field. His estimate—that the light climbed one mile in one second—provided data for a simple calculation of acceleration and speed.

In the analysis of the sighting from the Cessna 150, where a light shot upward at an estimated mile in one second, a constant, or average, acceleration “a” can be calculated:

$$a \text{ (acceleration)} = 2h \text{ (vertical height)} / t^2 \text{ (time squared)}$$

where $h = 1$ mile (5,280 feet) and $t = 1$ second. Then, the speed “v” can be calculated, using the calculated value for acceleration:

$$v \text{ (speed)} = a \times t = 10,560 \text{ ft/S}^2 \times 1 \text{ S} = 10,560 \text{ ft/S}$$

From Drake’s estimates, the acceleration—assuming that it was constant during the first second of flight—was calculated to be an incredible 10,560 feet per second squared. Since 88 ft/S is equivalent to 60 miles/hour, then 10,560 ft/S divided by 88 ft/S yields a speed at the end of one mile equal to 7,200 miles/hour.

This acceleration is 330 times the acceleration of an object falling to earth (in a vacuum where there is no air resistance) near the earth’s surface. The latter acceleration, commonly called “acceleration due to gravity,” is approximately 32 feet per second squared.

Physicists and engineers use a term called “g-force.” For example, a human sitting or standing is under a g-force equal to his or her weight. Although structures can be built to withstand thousands of g-forces, for the sighting under discussion, an occupant of the “craft” would have experienced a g-force 330 times his/her weight, sufficient to crush most living creatures. A 100-pound human aboard the “craft” would have experienced a force of 33,000 pounds—nearly 16.5 tons! Could a human possibly withstand this force, even with proper equipment? Humans thoroughly trained and immersed in a fluid to equalize the distribution of force over the entire body surface can withstand 30 g’s of acceleration for more than one second.⁵ NASA officials abandoned this concept early in the space program in favor of contoured couches, for which an astronaut could withstand 14 g’s for a period of two minutes. This is far less than the 330 g’s calculated from Drake’s estimate.

At a speed of 7,200 miles per hour, there should have been a terrific sonic boom. Sonic booms occur when vehicles traveling in air achieve the velocity of sound—about 720 miles per hour, the so-

called sound barrier. The value of 7,200 miles per hour is *ten times* this value.

More important, if the light we observed were attached to a solid object, its luminosity should have increased with altitude. Friction developed between the air molecules rushing over the surface of the object and the surface itself would have quickly raised the skin temperature to incandescence, or else caused the object to disintegrate. Instead, Drake observed the light *fading out* with increasing altitude.

Friction produced by the rapid motion of an object through the atmosphere presents a real engineering problem. Jets fly at high altitudes where the density of air molecules is less—hence, less friction than at lower altitudes. At high altitudes, the jet is more fuel-efficient. For example, the F-15 jet fighter, manufactured in St. Louis by the McDonnell Douglas Corporation, flies at 60,000 feet, an altitude of more than eleven miles.⁶ The world's fastest jet, the Lockheed SR-71 reconnaissance aircraft, has attained a speed of 2,193 miles per hour, but a fixed-wing rocket-powered aircraft has been clocked at 4,534 miles per hour.⁷ This wasn't at low altitude.

In the early years of the space program, NASA scientists were forced to solve the problem of heating because of friction on reentry of space vehicles from high in the atmosphere. They settled on a blunt design of special material which ablated, dissipating the heat by melting, and thereby protecting the space capsule. Meteors are another example of friction produced by motion through the atmosphere—at altitudes of 48 to 60 miles where the air is very rarified—at speeds ranging from 30,000 to 160,000 miles per hour. Meteors are usually about the size of a grain of sand, but because of their high speed, the particles encounter many molecules per second. Friction causes the particles to heat to temperatures where they become luminous. The air molecules in the path of the meteor become ionized and also give off light. Once meteors enter the denser layers of the atmosphere, most vaporize completely.⁸

In our sighting, the red and green colors did not appear until the light shot upwards. Perhaps the colors derived from excitation of atmospheric gases.⁹ But my observation of the three well-defined streaks, each of a different color, negate that explanation.

Other observations raise questions about the complexity of the sightings. For one thing, no land vehicle could ascend more than halfway to the top of Clark Mountain, even by day. For another, each light was a single ball of light of some size. Had either source been

automobile headlamps, two lights would have been discerned. The simultaneous extinction of the first light with the appearance of the second light seemed more than a coincidence, since both lights seemed identical in size and color. And the second light went upward at tremendous speed and acceleration, far greater than that of any known vehicle. In fact, the light appeared to be going full speed from the instant it started—a physical impossibility. My interest took a decided leap after these two sightings from the Cessna 150. But although the appearance and behavior of the two lights were perplexing, I did not accept them as UFOs at the time.

According to two men from Farmington, flying lights were active elsewhere in the vicinity that same night. Their account of a strange experience¹⁰ is important here not only because of its content, but because of a decision I was to make under somewhat similar circumstances at Farmington in May.

Kenneth Pingel, a twenty-three-year-old commercial pilot with more than 5,000 hours of flying experience, was returning home to Farmington in his Piper Cherokee airplane. A friend, Marvin Colyer, was serving as copilot. At about 10:30 P.M. they were twenty miles north of Farmington, flying at 150 miles per hour, when Colyer spotted a light off the left side of the aircraft. Although the distance to the light was difficult to ascertain, it appeared to Pingel to be relatively close and about four to six inches in diameter.

"It gradually turned to a yellowish tinge with an orange tinge around the circumference," Pingel reported. "The object also appeared to be moving at the same speed we were. As we looked at it, the object disappeared." But there was more to come.

"As we arrived in Farmington and were on our final approach to land, we looked up, and the object was coming at us at a very high rate of speed," Pingel continued. "Once again, the object was about six inches in diameter and had a beam of light from it at about a 30-degree angle towards the ground."

Pingel said that at first they thought it was another airplane. When he discovered that it wasn't, he pulled up and started to fly toward the object. The object stopped instantly, reversed its direction, and started to move away at high speed. "We followed it about two miles northeast of Farmington at 140 miles per hour," Pingel said. "Its size didn't change; it just faded away." After landing, they discussed the fact that it did not appear to grow larger when approaching, but maintained constant size. "That was one thing really strange about the object," Pingel told me.

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2. E. Hecht and A. Zajac, *Optics* (Reading, Mass.: Addison-Wesley Publishing Co., 1974), p. 354.
3. John Strong, *Concepts of Classical Optics* (San Francisco: W. H. Freeman & Co., 1958), p. 485.
4. Condon Report, p. 623.
5. Paul Webb, *Bioastronautics Data Book*, NASA SP-3006.
6. *St. Louis Globe-Democrat*, August 11-12, 1979, p. 1.
7. *St. Louis Globe-Democrat*, August 8, 1979.
 Richard Hall, *The UFO Evidence*, National Investigations Committee for Aerial Phenomena (NICAP), Washington, D.C., May 1964, p. 81.
 Leonard Cramp, *Piece for a Jigsaw* (Isle of Wight, England: Somerton Publishing Co., Ltd., 1966), pp. 20-23.
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8. George Abell, *Exploration of the Universe* (New York: Holt, Rinehart & Winston, 1964), p. 304.
 "Meteor Weather Vanes," *Engineering Outlook*, College of Engineering, University of Illinois, Vol. 21, No. 2 (September 1979), p. 1.
9. James M. McCampbell, *Ufology, New Insights from Science and Common Sense* (Belmont, Calif.: Jaymac Co., 1973), ch. 3.
10. *St. Louis Globe-Democrat*, April 23, 1973.



PROJECT IDENTIFICATION

The very next evening King Turnbull—another physics major—and I set up equipment in the Brushy Creek area not far from where the initial Bone sighting had occurred.

About 20 persons were already congregated along the roadside to watch the sky. Before dark, I set up the telescope and leveled the base with a spherical bubble, which floats in a compartment of circular symmetry, so that the bubble is free to move in any direction, unlike the carpenter's level where the bubble is constricted to move back and forth along a transparent tube. Now the telescope could be used not only to view but to measure the angular elevation as well, employing the same method a surveyor uses with a transit (Fig. 3.1).

To the east, a peak with an angular elevation of about seven degrees dominated our view. The peak was flanked by other elevations to the north while the level Black River valley opened to the south. I would have preferred a viewing station atop the highest mountain, if there were no trees to obscure the view. But I had been told that the Brushy Creek area was a good place to observe. My informants were correct.

The first light to cross our front appeared at 7:18 P.M., at an estimated angle of 60° left of east over the hills to the northeast. The amber color gradually changed to an off-color white as it neared. I did not attribute this to any inherent color change in the light itself, but to absorption of the shorter wavelengths of the visible spectrum

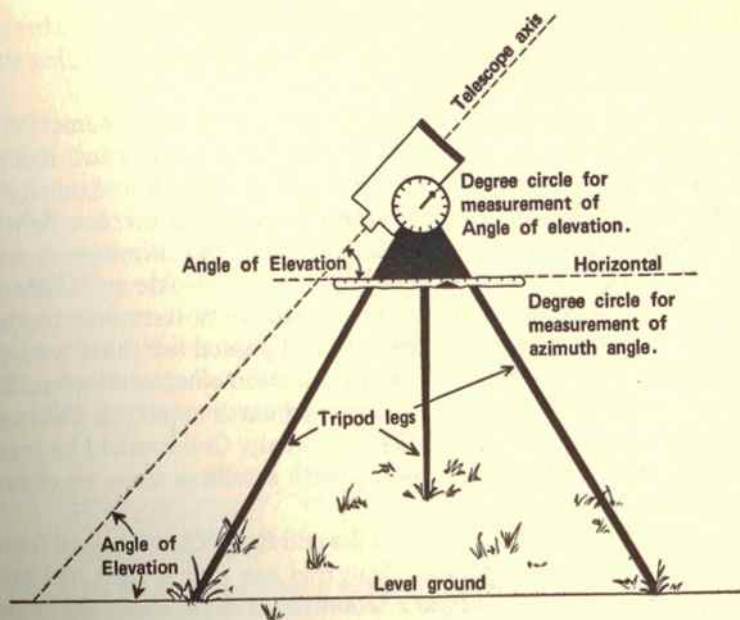


Fig. 3-1 Telescope used as a surveyor's transit to measure the azimuth and angular elevation

by the long path through the atmosphere.¹ A primary example of the phenomenon is that of the setting sun, whose light passes through a longer atmospheric path than when the sun is overhead. The effect depends on the density and size of particles (water vapor, smoke, dust, and so forth) present in the atmosphere. On some evenings, when the sun is a deep red, the effect is more pronounced.

As the off-white light approached, it gradually changed to its natural color. I tracked it with the Questar telescope on 80X. Like the observations the week before, this was a ball of light. Using the telescope, the angular elevation was measured to be ten degrees when the light was due east of our position. The procedure was to be repeated for three subsequent sightings during the evening.

At 7:28 another light came into view, following a similar but lower path. When due east of our position, the angular altitude of this light was only five degrees. This light passed behind the hill to our front.

At 8:30, an aircraft approached from the east. When within about five miles of our position, it turned and retraced its path. Just for practice, I watched it recede for at least ten minutes with the

naked eye. Lights on the aircraft could be clearly discerned when it was close; the flashing xenon strobe light could be seen during the entire observation.

The third light was seen at 9:20, traveling south to north, a reverse path when compared to the paths of the other two lights. Like the elevation of the first light, the angular elevation of this light was ten degrees. It was similar in appearance to the other two lights.

Fifteen minutes after the 9:20 sighting had terminated, two men drove up and introduced themselves as Jim Becker and Clifford Crites from Williamsville, a town approximately ten miles to the southeast. They reported that the light had passed two miles west of Williamsville at low altitude. That information eliminated even the remote possibility that we were observing earth satellites, because any satellite between Williamsville and Brushy Creek would be seen only by looking straight up. Usually, earth satellites come no closer to earth than about 180 miles.

At about 10:00 P.M., Jerry Hollis and Ron Wilson arrived from KFVS-TV in Cape Girardeau. They told me that a light had approached their position on Pyle's Mountain at 8:30, about the same time that we had observed the aircraft in the east. Because many of the persons at our viewing site had scanned the sky in all directions, I wondered why someone hadn't seen the light approach Pyle's Mountain.

But Hollis and Wilson weren't the only ones to see it from Pyle's Mountain. Robert J. Nistler, construction supervisor for the Metropolitan Sewer District, his wife, Mr. and Mrs. John W. Werner, and about 20 other persons saw the "silent, bright, amber-colored, steady ball of light" approach from the southeast. Nistler estimated the diameter of the ball at eight inches. Quickly he ran to his car, got his 35-mm camera, rushed back, set the lens to infinity, steadied himself against a tree, held his breath, and took a six-second exposure (Plate 1). The light, which had not passed his position when the exposure was made, was at an estimated angular height of 45° . Then, the light made an abrupt turn to the northeast, diminishing immediately in size and in brightness.

Nistler used Kodachrome film, ASA 64, in a Minolta Hi-Matic-9 rangefinder camera with a Rokkor PF 45-mm f/1.7 lens (52° field of view). The color slide has been recopied on black and white HP-5 film. From right to left, the sense of the motion of the light, the upper trail is orange while the lower trail is yellow with the two trails crossing near the left side of the exposure, creating a bright patch of light. On the right side of the exposure, a definite break (or gap)

appears in the orange (upper) trail. It cannot be attributed to an intervening cloud.

The next and last sighting caused me real consternation. At 10:45, another ball of light appeared, very similar to the first one: same direction of travel (north to south), same color (white), and same angular altitude (10 degrees). But a major difference soon developed. As the ball of light was progressing across our front, I was tracking it with the Questar telescope on 80X—not an easy task. Suddenly, a streak of orange light came from the opposite direction on a collision course. In that split second, my brain registered the event, but I didn't have time to tense. But—no collision occurred! The streak ended at the slow-moving ball of light (Fig. 3.2). Hollis and Wilson, who were using binoculars, confirmed the event.

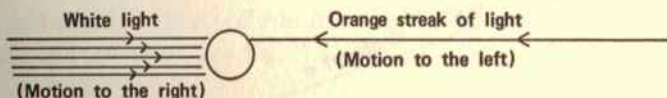


Fig. 3-2 An orange streak of light appeared to enter a slow-moving light (Brushy Creek; 10:45 P.M., CST, April 13, 1973)

Because we had measured the angular elevation and had timed the transit across our front for two of the sightings; and because Becker and Crites had informed me that the third light had passed between our location at Brushy Creek and Williamsville, allowing me to approximate the paths of the lights, estimates of altitude and speed could be made.

I assumed that the distance to each light, when due east of our position, was five miles. Consequently, the corresponding altitude of the light can be calculated with simple trigonometry. The altitude "h" of a light/object can be measured indirectly if two other quantities are known or can be measured (see Fig. 3.3): the vertical angle

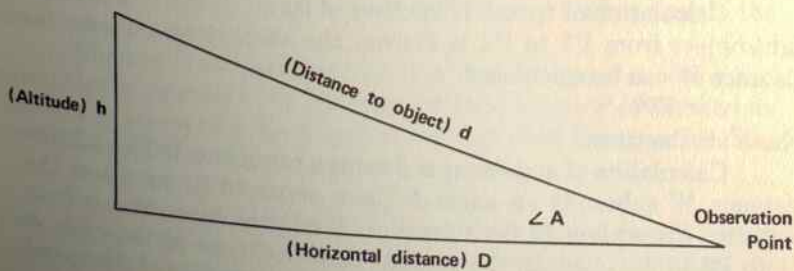


Fig. 3-3 Sideview of the altitude triangle

A , sometimes called the "angular altitude" or "angular elevation," and the horizontal (ground) distance D to a point directly under the light/object. Examples of devices to measure the angle A are transit, theodolite, and telescope (Fig. 3.1). The equation for altitude is:

$$h = D \tan A$$

where the value of tangent A can be obtained from a trigometric table or from a calculator such as the Texas Instruments model SR 51, Sharp Elsimite model EL-8109, or Hewlett-Packard model 35.

Calculation of the size of an object or the distance it travels: If a light/object moves from point P1 to point P2 (Fig. 3.4), the

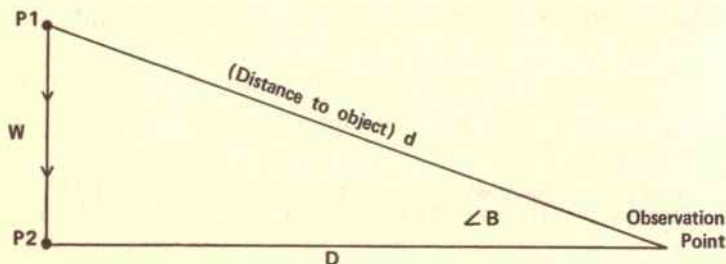


Fig. 3-4 Top view of azimuth triangle

distance W can be calculated if the distance D and the horizontal angle B are known (measured). The distance D is called the distance of closest approach (DCA) because it is the minimum value of d , the distance from the observation point to the moving light/object. Note that the line D is perpendicular to the line W . The equation for W is:

$$W = D \tan B$$

where again the value of tangent B can be found or calculated. Note also that W could be the size of a vehicle subtending an angle B at the observation point.

Calculation of speed: If the time of travel (transit time) of the light/object from P1 to P2 is known, the average speed over the distance W can be calculated:

$$v = W/t$$

where t is the time.

Calculation of angular speed using a telescope: In Fig. 3.5, the distance W subtends an angle B (here assumed to be 6°) at the objective (front) lens of the telescope. If a light/object travels from P1 to P2 in 24 seconds, the angular rate of change of the angle B (angular speed) is $0.25^\circ/\text{S}$. Of course, the distance W and the speed

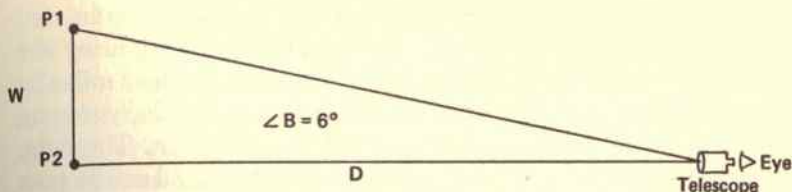


Fig. 3-5 Telescope used to measure angle

v can be calculated if the distance D from the telescope to the light/object is known.

Size, speed, and angular speed from photographic negatives: Most of the data gathered in Project Identification were recorded photographically. The importance of photography in scientific research is stressed in a NASA publication.² To calculate the size, speed, and angular speed of a moving light/object from its trail on a photographic negative, see Fig. 3.6.

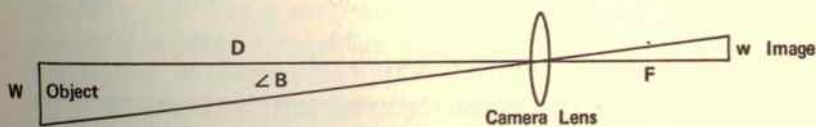


Fig. 3-6 Similar object and image triangles

Let W equal the actual size of an object whose image length on the negative is w . Then, the length W can be found from the relation:

$$W = wD/F$$

where D is the distance from the camera lens to the light/object and F is the focal length of the camera lens—800 mm, for example.

If, instead, W represents the path of a moving light/object, the path distance W can be calculated, using the corresponding distance w on the negative. Further, if the transit time is known, the speed v can be calculated.

Whether D is known or not, the angular speed of the light/object can be calculated by knowing the focal length F of the camera lens and by measuring the length of the trail w on the negative. The angle B is calculated from:

$$\tan B = w/F.$$

Speed can be estimated if the distance traveled in a known time can also be estimated. For the first and third sightings, the lights were timed during transit—that is, during their motion across

our entire front. Insofar as the light was first seen at an estimated angle of 60 degrees left of east, the distance traveled during the transit would be about seventeen miles. Dividing seventeen miles by the measured transit time of three minutes, for example, yields an average speed of 340 miles per hour for the first light. The data, although crude, were all that we had at this juncture, and can be seen in Table I.

TABLE I BRUSHY CREEK AREA: FRIDAY, APRIL 13, 1973
SUNSET (6:30 CST)

Order	Time (PM)	Direct.	Transit Time (min)	Ang. Alt. (degrees)	Altitude (feet)	Speed (mi/hr)
A	7:18	N-S	3	10	4655	340
B	7:28*	N-S	—	5	2310	
	8:30	(Aircraft was sighted in the east)				
C	9:20	S-N	8	10	4655	130
D	10:45	N-S	—	10	4655	—

*The light passed behind the hill directly in front of our position.

Certainly the lights were not earth satellites, nor were they burn-up vehicles reentering the earth's atmosphere as one man suggested.³ Each of the four lights appeared to be a single ball, even through the telescope on 80X.

Apparently FAA regulations for aircraft lighting were not observed. Paragraph 25.1385b of these regulations states clearly that "forward position lights must consist of a red and green light spaced laterally as far apart as practicable and installed forward on the airplane so that, with the airplane in normal flying position, the red light is on the left side and the green light is on the right side."

Another position light is required near the rear of the airplane, as stated in Paragraph 25.1385c: "The rear position light must be a white light mounted as far aft as practicable, and must be approved." In Paragraph 25.1387 of the FAA regulations, the angles at which the rear position light must be visible are delineated. To paraphrase, the rear position light should be easily seen from behind the aircraft but must not be visible from positions in front of or to the side of the airplane. Hence, the rear position light of an approaching airplane should not be seen by an observer on the ground until the airplane is nearly even with the observer's position.

Paragraph 25.1401 describes the requirements for the anti-collision light system. The arrangement of the system "must give an effective flash frequency of not less than forty nor more than one hundred flashes per minute. Each anticollision light must be aviation red or aviation white."

No navigation lights, no position lights, and no flashing strobe lights were seen. For an aircraft or helicopter, the configuration of lights will change as the craft passes an observer. The four balls of light that I observed did not vary except for the color change; each remained a single ball of light for the entire transit.

The antics of the first three lights were not unworldly, but the last one, where the orange light apparently collided with or entered the slower-moving light, presented an enigma. Perhaps this didn't happen at all; perhaps the orange light came close to the white light and just as they met, went off. But why? Finally, the orange light traveled at incredible speed. An astronomer at the University of Missouri suggested to me privately that we had observed a meteor. Although that was a rational explanation, I found it difficult to accept. How many meteors are seen at an angular altitude of five or ten degrees, so near the horizon?

King and I went to the radio station to spend the night. Hovis, with the permission of owner Gloria Bumpus, had graciously offered us the upstairs for lodging. King spread a pallet on the floor, while I occupied a short vinyl couch. Soon King fell asleep, but my mind dwelt on the lights we had seen at Brushy Creek, especially the orange streak. It reminded me of a similar observation I had made one summer night in 1953 near Jefferson City. While sitting in an open convertible with a date, I had noticed red light reflecting off the dash. Looking up instantly, I saw a small red ball of light passing swiftly from west to east. I exclaimed to my date: "Look!" She barely caught a glimpse of it disappearing over the horizon.

Peculiar aspects of that 1953 sighting bothered me as I reflected on it. For one thing, the color did not change, as is usually the case with meteors. The red ball of light resembled the red taillight of some automobiles. Second, I estimate that the light passed from horizon to horizon in about four seconds, traveling in a horizontal path at an altitude of about one mile. Assuming that the horizon to horizon distance was 40 miles, the speed of the light was 36,000 miles per hour! At an assumed altitude of ten miles, the light's speed would have been greater than that of the fastest meteors.

Never suspecting at the time that the sighting could have

been a UFO, I shrugged it off, partly because the duration of the sighting was so brief. From what I know now, I doubt that the fast-moving light was a meteor.

On Saturday night, April 14, I was stationed on the south slope of Clark Mountain, about halfway to the top. I was with Richard Lee Toney, his wife Joan, and their son Mike, then a pre-medical student at the University. Stationed about three miles away at the airport were Dr. Robert Freeman, nuclear physicist in the department, and King Turnbull. Our two groups unsuccessfully attempted to maintain contact via flashlight signals, but one observer at each station had to watch the other viewing station continuously for this method to work. Although we didn't see anything from the mountain, Freeman and Turnbull did see a moving light in the distance. From our dismal experience with the flashlight method of communication, we decided to change Project policy: the method would not be used again in an attempt to maintain continuous communication between two viewing stations.

In all, twelve lights had been seen in three nights of viewing. Although the source of the lights remained a mystery, I was not yet convinced that these were unidentified—or unidentifiable—flying objects.

After these sightings, I decided to come to Piedmont every weekend to initiate a formal investigation. The opportunity for scientific study was obvious because the flying objects were appearing frequently near a given place, and the probability of acquiring data was high. I believed that the objects would remain near Piedmont and that a field study using instruments was feasible. Also, I would need a crew and at least one senior scientist from the faculty to assist me. Funding would be needed to support the research.

The next weekend I led a large contingent of professors and students to Piedmont. The group included Ueleke, Hodges, Kam-bitch, and James Sage of the Industrial and Technical Education Department. Unfortunately, we had no sightings. Ueleke and Hodges withdrew from the field investigations, as did Dr. Freeman. Freeman had come to Piedmont on Saturday night, April 14, at my request. But most important, I did persuade Dr. Sage to help in further field study.

Jim Sage was building a good electronics program in his department and required his students to take several courses in

physics for a minor to give them a firm understanding of the basic principles of electronics. I judged tall, handsome, self-assured Jim to be his own man and not one to make foolish decisions. He had served in the U.S. Army as a military policeman. His students liked him, and so did I. His experience in practical electronics was exactly what I needed. In addition to his technical competence, his presence would be a great morale booster for me. I wouldn't have to stand alone.

First, our organization would need a name. I settled on "Project Identification" because of the second of its two major objectives:

1. *to measure the physical properties of the lights and/or objects in the sky*
2. *to identify their origin.*

In addition to Dr. Sage, we needed a crew. Immediately, Drake Kambitch, John Wilson, and King Turnbull volunteered their services. Others have joined the organization from time to time. At least thirty-five scientists, engineers, students, and lay persons have assisted in the field research at one time or another.

I insisted, however, that lay reports not be accepted as scientific data. A "lay report" we defined as a written or oral UFO report from a person who did not have a qualified scientific background—that is, college training or equivalent experience in one of the physical sciences. I intended to present the results of our Project Identification investigation at a scientific meeting, just as I would if I were doing any other kind of research; and most scientists place no validity in lay reports. One scientist told me that a woman who had lived in a rural location for about twenty-five years still didn't know north from south. The example is extreme, but I have occasionally encountered similar circumstances. Nevertheless, some lay reports are excellent in their detail and clarity. We welcomed lay reports because they indicated where and when flying objects might be appearing, giving our field research teams a chance to respond when the probability of observing such an object was relatively great. Almost all lay reports were and are reviewed and catalogued in Project Identification headquarters. A few are included throughout this book, but only if they seem reliable and serve some specific purpose, such as to support a unique facet of the UFO phenomenon. Information from other persons is used sparingly and with reservation. My case for the existence of UFOs is presented primarily from Project evidence.

We planned a full-scale investigation for the interim between the end of the spring semester and the beginning of the summer

term—a period of three weeks. There was little time to obtain funding, so I wrote the same letter to each of three large metropolitan newspapers in Missouri:

April 26, 1973

Dear Sir;

I have organized an investigative research team of University staff members, qualified students and other scientists and engineers in the Cape Girardeau area under the name Project Identification. Our purpose is to study the nature and origin of lights that appear almost nightly in the sky in the vicinity of Piedmont.

On Friday evening, April 13, I observed phenomena that led me to believe that our study should be continued on a much broader basis. Beyond the sensationalism, I suspect that there is an important and interesting story to be obtained.

Our approach is to obtain data by the use of such scientific instruments as radar, electromagnetic frequency analyzer, high-frequency low-intensity sound detector, spectroscopic camera, Questar astronomical telescopes with cameras attached, photographic equipment and an assortment of other devices. The more expensive instruments can be obtained on loan or rental while several items of equipment are available from various departments of the University.

Unfortunately, the University is on a fixed budget and cannot support an investigation of the magnitude required. I solicit your support and hope that a large metropolitan newspaper in Missouri will find wisdom and public service in our undertaking.

I am 47 years old and have experience in planning and organization. I was president of the Missouri Academy of Science last year. Other faculty members involved are mature and responsible.

I will wait for your reply.

Sincerely,

Dr. Harley D. Rutledge

Head, Physics Department

Director, Project Identification

George A. Killenberg, managing editor of the *St. Louis Globe-Democrat*, invited a written proposal which subsequently was approved. The Project's contract with the newspaper read:

It is the understanding at the Globe-Democrat that the results of the investigation will be reported to the scientific community for scrutiny eventually, but that all current releases, reports, and all other

statements about the findings of the project group, other than those made by volunteers, will be through the *Globe-Democrat* only.

Without the financial support of the *Globe-Democrat*, the scope of the field study would have been severely limited.

Hence, at the end of the spring semester at the University, our group, consisting of Dr. Sage, several students, and me, went to Piedmont to establish field research headquarters.

NOTES

1. M. Minnaert, *The Nature of Light and Color in the Open Air* (New York: Dover Publications, Inc., 1954), p. 239.
2. Albert J. Derr, *Photography Equipment and Techniques, A Survey of NASA Developments*. (NASA SP-5099, U.S. Government Printing Office, Washington, D.C., 1972.)
3. Steve Erdman, "The Distortion Factor," *Probe the Unknown*, Vol. 2, No. 2 (Spring 1974), p. 47.

4

ANOMALOUS LIGHTS AND COINCIDENCES

Having read most of the literature concerning UFOs since 1973, I concluded that there is little agreement among scientists regarding the terms used to describe UFOs. Consequently, the public does not receive a consistent and coherent account of the UFO phenomenon from scientists. To add to the public's confusion, scientists can't even agree on how to *pronounce* "UFO,"¹ an acronym for "unidentified flying object." Some pronounce it *youfo*; Condon, and later Menzel, preferred *oofo*, while most choose to pronounce it as it is spelled: U-F-O. This is the pronunciation that I prefer.

The term originated May 13, 1954, in an Air Force press release describing radar and visual sightings over Washington, D.C. Air Force spokesmen in the Pentagon told the press to call them "unidentified flying objects."²

For the first two or three years of our investigation, I did not use the term "unidentified flying object" or the acronym "UFO" publicly. To us in Project Identification, these terms carried a connotation almost as unsavory as that of "flying saucer." For example, in the November 18 issue of the *St. Louis Post-Dispatch*, Jerome P. Curry, the science reporter, wrote: "Rutledge avoids the use of the term 'unidentified flying object' because he does not want to be associated with what he terms the lunatic fringe. He is fearful

that his reports may be met with scorn by those who are afraid to accept what he says he has seen." In titles of various papers I have given, the phrase was purposely withheld.³ Instead, I used the euphemism "anomalous lights," though I had seen objects by day as well as by night.

Among scientists, UFO issues arouse emotions; scientists take sides; attitudes harden. They become skeptics or believers. For instance, the phrase "flying saucer" is rather explicit if taken literally, yet it has a bad connotation. Among skeptics it arouses the specter of invasion from space. The jacket of a recently published book by the late Dr. Donald Menzel (a hardened skeptic before his death) bears the statement: "This is *the* [italics his] book that proves that 'flying saucers' are not extraterrestrial vehicles bringing little green men from outer space, but illusions produced by easily explainable meteorological and optical phenomena."⁴ Throughout my experiences in the field, evidence has been gathered that refutes his statement that UFOs are nothing more than illusions.

Dr. David M. Jacobs recognized the problem when he wrote: "There are semantic difficulties in a discussion of unidentified flying objects." Further, he pointed out that people "use the terms *flying saucer* and *unidentified flying object* synonymously."⁵ He didn't offer a solution, but tried to use the terms the way the observers of the UFO phenomenon used them. He should have defined these terms to remove the ambiguity, although he did differentiate between a UFO sighting and a UFO report.

When our field research began, we were not concerned about definitions of terms. We soon realized, however, that we were using the term UFO in a general sense. Incredible sightings were grouped with those that were merely extraordinary. After about a year of field experience, I suspected that someone—say Air Force officials—might explain a number of the extraordinary sightings, with the consequence that the public would infer that *all* of our sightings, including the incredible ones, could be explained as well. By differentiating between the two types of sightings, we found it easier to classify them. Hence, the definitions given here are functional, arising from our direct experience in the field. We defined Class A UFOs as lights and/or objects that *can* be identified as having bizarre behavioral and/or physical properties that defy conventional explanation. Class A sightings are of the *incredible* variety.

Obviously, the term "flying saucer" does not require a separate definition, but is merely a subset of Class A sightings. Should

man-made disc-shaped objects become prevalent in our skies, greater discretion in applying the Class A definition will then be required.

An example of a sighting of a Class A UFO occurred the night of May 24, 1973. While standing in the middle of the concrete runway at the Farmington Municipal Airport, John Wilson, two other observers, and I saw a configuration of four lights pass silently overhead. Apparently, the lights were on the trailing edge of a huge wing, although the shape of the vehicle was not discerned. Each individual light was long and narrow, like that on the rear of some automobiles. From left to right, the colors were white, red, red, white, a symmetrical pattern. The sighting was labeled Class A (incredible) because of the large angular width of the configuration as measured through binoculars, because the configuration was unknown in aviation circles, and because there was no sound in the quiet of the night. All of these are abnormal technological attributes.

Class B UFOs, seen much more frequently than Class A UFOs, are defined as lights and/or objects that *cannot be* identified using available instruments, but which, in the judgment of the observer, do not display bizarre behavioral or physical properties that would defy rational explanation.

Class B UFOs are more difficult to assign than Class A, partly because they comprise the middle portion of the spectrum between Class A UFOs and identified flying objects (IFOs) such as airplanes and helicopters. Class B UFOs range over the extraordinary, but are neither incredible nor commonplace. Since judgment is required, the more experienced the observer, the better. Class B UFOs are usually observed as lights or lighted objects at night; they are not necessarily nocturnal lights. For example, a light that was not visible during a check of a particular region of sky may be found there moments later. Conversely, a light may go off or simply fade out. Of course, lights on airplanes and helicopters may be switched on or off. Lights may fade out when they are covered by a patch of haze. But this is where experience and judgment prevail.

A light that hovers and then moves away is always suspect, since few vehicular types can hover: helicopters, VTOLs (vertical takeoff and landing), craft developed by NASA, and Hovercraft. The latter vehicle operates within inches of the earth's surface; hence, it will not be seen in the sky. The VTOL is jet powered and should emit light and sound when hovering. Helicopters emit sound, but certain types are relatively quiet compared to the models that flew a decade ago. As more sophisticated vehicles are developed, the task of

identification and differentiation becomes increasingly difficult.

The classification of a sighting depends not only on the observer but the observing equipment used and the distance to the sighting. For instance, binoculars allow an observer to see more detail than with the naked eye, and also allow surveillance at greater distances. On the other hand, the angular view is very limited compared to the naked-eye view. The naked-eye classification of a sighting may change when binoculars are used. Again, experience and judgment are important factors in classifying UFOs.

Up to this point, the terms "UFO" and "sighting" have been used interchangeably. Since the term "UFO" has been defined, the term "sighting" is defined as a temporal event, existing in time for as long as one UFO is in view.

A sighting may involve one or more UFOs. For example, the event I was to witness from an aircraft near Piedmont on May 11, 1973, was a single sighting of ten UFOs, i.e., a multiple-UFO sighting. One sighting may follow another, but there must be a time break between. A UFO may be counted as two sightings if it passed within visual range of two viewing stations several miles apart.

As with UFOs, sightings may be classified as A or B sightings. The classification of a sighting of a single UFO is the same as that of the UFO. In the case of a multiple-UFO sighting, the sighting will be classified B unless there is at least one Class A UFO present; in that case, the sighting is Class A.

In his classic book, *The UFO Controversy in America* (1975), Dr. David M. Jacobs wrote about our effort: "One of the most ambitious of the scientific research projects on UFOs took place in mid-1973. . . ." Although short of funds, we had a modicum of equipment in the field. Optical equipment included several cameras, binoculars, three Questar telescopes, one C-8 Celestron telescope, and a Soligor lens of 800 millimeters (about 31 inches) focal length, which was the workhorse of the Project. Electronic gear included a Tektronix spectrum analyzer, oscilloscope, and three transceivers operating on a frequency of 37.1 megahertz (MHz). A portable 1.5-kilowatt generator, driven by a gasoline engine, provided the alternating current to power the electronic equipment.

The weekend of April 27 I was in Columbia, Missouri, to attend the annual meeting of the Missouri Academy of Science. Past presidents were to be honored at a banquet; I felt obliged to attend.

Apparently, I missed a great show in Piedmont. Debbie Ellis, a University student from Portageville, told me that on seven occasions a light came into the vicinity of Pyle's Mountain, causing much excitement among the observers. After learning of these sightings, I was eager to return to Piedmont on Friday, May 4. Three physics majors came along: King Turnbull, Jon Hardgrove, and John Wilson. Hardgrove was working as an engineering technician with the Missouri Utilities Company. During the ensuing months, Wilson would be my partner in the field.

After synchronizing our watches, Turnbull and Hardgrove went to Brushy Creek, while John and I observed from Pyle's Mountain.

At 9:11 P.M. the crew at Brushy Creek observed a light approach from the south. Orange in color, its brightness varied, possibly because of haze and clouds. When directly in front of their position the angular elevation was 10° , the same value as measured for three of the four sightings at Brushy Creek on April 13.

Four minutes later, a light approached Pyle's Mountain from the southeast. Since the light apparently covered nine miles in four minutes, its average speed was 135 miles per hour. It was not very bright. We waited for it to clear the treeline in front of us, but it abruptly turned north. Carrying a 35-mm Praktica camera mounted on a D & S tripod, John ran to the opposite side of the treeline, where he planted the tripod firmly on the ground. Using a Kalimar wide-angle lens (63° field of view) of 35-mm focal length, he took a ten-second exposure. The film used was black and white Kodak 2475 recording film, ASA 1000, a highly sensitive film developed for police surveillance at night under low light conditions. Its American Standards Association (ASA) rating of 1000 indicated the film's sensitivity to light. The higher the ASA rating, the less the amount of light required to form an image on film. (ASA ratings of commercial films range from ASA 25 to ASA 1200 and more.) When the exposed film was developed, the pattern on the negative was not what we expected.

The photograph, magnified 14.5 times in printing (Plate 2), presents a dilemma. Since the camera shutter was open for ten seconds, the path of the moving light should have recorded on film as a line, or trail. Instead, the photograph shows a pattern of fractionated light, while the naked-eye and binocular views were of a single ball of light. Because of haze, clouds, and the short exposure time, no stars appear in the photograph.

The photograph taken on Friday night presented an enigma,

but other photographs obtained two weeks later from Pyle's Mountain would prove to be even more puzzling.

Following John's exposure, the light turned east and faded from view. Less than a minute later, I picked it up going north again. As it receded, I observed red light *mixing* within the ball of white light. Moments later, green light rather than red light mixed with the white. Since this observation, I've seen many aircraft and helicopters that flash individual lights, but none has resembled the effect I observed that night.

Saturday night, a chilling wind blew under an overcast sky. John and I spent several miserable hours on watch, huddled under a blanket while sitting on the top step of the fire tower on Mudlick Mountain in Sam A. Baker State Park. Although we saw no UFOs, an innocuous event led me to stop and analyze a certain aspect of sightings to that date.

We had taken along candy bars, a thermos of coffee, and two paper cups. After climbing the tower, I placed the candy bars and thermos on the top landing, wedging the paper cups between the steps and one side of the landing. About an hour later, I asked, "John, are you ready for a picnic?" When he said he was, I turned to reach for the paper cups. But just as I was about to grasp them, they rolled across the landing and sailed into the darkness below.

"What a coincidence, John!" I said. "There have been quite a few of those lately."

At that moment, I realized that I must be very cautious in my interpretation of UFO events. Obviously I could not read any implication into the paper cups' wind-blown disappearance; it was simply pure coincidence, too. And that paper-cup incident led me to examine our experiences to date, April 6 through May 5.

Although a few of the twelve sightings had been spectacular, I was reluctant to label them as UFOs. Certainly, I didn't accept any of the sightings as natural or astronomical phenomena, but I surmised that they could have been produced artificially. An obvious intelligence had directed their flight. More puzzling was their apparent reaction to our presence. For example, one light went out and another shot into the sky as Drake and I approached in the Cessna 150 the night of April 12.

A *reaction* means that a UFO did something that correlated with some act of our own. But all such "reactions" must necessarily be

labeled "coincidence" too, because we cannot know if the UFO truly reacted to us or if it was just a coincidence. Admittedly a contradiction in terms, the labeling scheme should still satisfy the large majority of people who cannot embrace the concept of UFO reaction to a human being. One fact remains: either UFOs reacted to members of the Project, or else we have a large number of coincidences.

But not all events labeled "coincidence" involved an apparent reaction of a UFO. For example, the sighting on April 12, when one light went off and another went on simultaneously, I label a coincidence, because I cannot prove that the lights, separated by several miles, were synchronized. During the last sighting the next night, an orange streak appeared to enter a white light. This too must be labeled a coincidence. How can I prove otherwise?

NOTES

1. D. H. Menzel and E. H. Taves, *The UFO Enigma, The Definitive Explanation of the UFO Phenomena* (New York: Doubleday & Co., Inc., 1977), p. 9.
2. Frank Edwards, *Flying Saucers—Here and Now* (Secaucus, N.J.: Lyle Stuart, 1967), p. 87.
3. Titles of papers given by the author:
 James E. Sage and Harley D. Rutledge, "Project Identification: A Preliminary Investigation of Anomalistic Lights in the Sky over Southeastern Missouri," Fall Meeting, American Association of Physics Teachers, Meramec Community College, St. Louis, Mo., November 17, 1973.
 Harley D. Rutledge, "Project Identification: Anomalous Lights over Southeastern Missouri," Illinois Science Teachers Association, Southern Illinois University, Edwardsville, Ill., October 19, 1974.
 Harley D. Rutledge, "Project Identification: A Progress Report on the Investigation of Anomalistic Phenomena in the Sky over Southeastern Missouri," Fall Meeting, American Association of Physics Teachers, University of Missouri, Columbia, Mo., November 9, 1974.
 Kenneth K. Kornstett and Harley D. Rutledge, "Project Identification: Instrumentation for Making Measurements of Anomalous Lights and Objects over Southeastern Missouri," Missouri Academy of Science, William Jewel College, Liberty, Mo., April 26, 1975.
4. Menzel and Taves, book dust jacket.
5. David M. Jacobs, *The UFO Controversy in America* (Bloomington, Ind.: Indiana University Press, 1975), p. 3.



A FORTY-FIVE SECOND TRANSFORMATION

It was 7:01 Friday evening, May 11, as the Cessna 182 lifted from Runway No. 02 at Cape Girardeau Municipal Airport. I occupied the copilot's seat alongside Jim Trickey; in back were John Wilson and Drake Kambitch. When we had boarded the plane minutes earlier, Drake's hesitation had indicated to me that he wanted to sit in front. An accomplished pilot, he itched for a chance to fly the four-seater airplane.

Drake and John were physics majors completing their junior years at Southeast Missouri State University, where I was their teacher. Jim, the pilot, had received a bachelor of science degree with a major in physics three years before. Now he was an engineering technician with the Missouri Utilities Company in Cape Girardeau. At this time, our usual teacher/student relationship didn't seem important. We were just four men on a strange mission to an Ozark town that recently had become the focal point of a mystery attracting national attention.

While the plane slowly climbed westward away from the Mississippi River, the four of us could see the reflection of the sun in the heavy floodwater below. Shortly after leaving the floodplain, we were over familiar wooded Ozark terrain where State Route 34 snakes its way from Cape Girardeau through yellow pine, red cedar, oak,

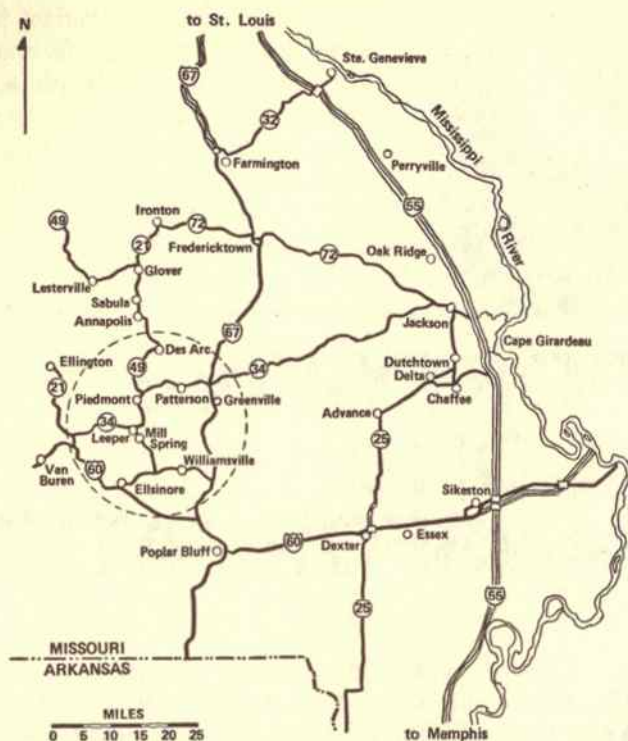


Fig. 5-1 Map of southeastern Missouri

cottonwood, hickory, and sycamore trees toward our destination of Piedmont, Missouri (Fig. 5.1).

The engine droned, making conversation difficult. From the back seat of the Cessna, Drake called out, "Dr. Rutledge, there are the mountains ahead." We had already covered more than half the 75 miles to Piedmont. The old, eroded St. Francois Mountains looked like bumps on the horizon. In fact, when Drake and I had made the initial flight to Piedmont, my first impression of the mountains had been that we were seeing a cloudbank in the west. As we continued, the peaks, ranging in elevation from 900 to 1,450 feet, loomed larger.

On our approach to Piedmont, I could see Clark Mountain, three miles east of town, where I had spent a cold, windy Saturday night in April on the south slope. We flew over Piedmont. There was Route 34-49 snaking up the mile-long hill that some local inhabitants called Pyle's Mountain, after the name of the man who operated the bulldozer at a landfill near the summit. The base of the mountain

encroaches on the town itself. By now a familiar landmark to me from the air, the mountain would become a favorite observing site from the ground. Until late February of that year, the mountain had always been a parking place for teenagers. Then, after strange lights and objects began appearing in the sky, adults began to go there nightly to take advantage of the panoramic view.

From these heights, on more than one night, I had seen lights that seemed completely out of the ordinary. I had been puzzled because they had not looked like lights on aircraft or helicopters, but at the time I didn't know what to call them. Although media persons used the term "unidentified flying object," I was unwilling to label these sightings as UFOs. Perhaps, I thought, I couldn't interpret my sightings correctly because I was an inexperienced observer. After all, physics professors seldom spend their nights on mountaintops looking for strange lights. They are more at home in the laboratory, or working at a desk or computer. But this particular trip to Piedmont on May 11, 1973, was to change my research plans completely.

After circling the town twice, we headed north to set the boundary for our area of search. We flew north for some time, noting on the flight chart small towns such as Des Arc, Annapolis, Glover, and Lesterville. In early April, a truck driver had been driving from Lesterville to Annapolis on Route 49 after dark. Later, he had reported seeing something approaching from across the field. A dark object had beamed down three huge bright lights, illuminating a broad area of the field. The driver had slowed his truck to a crawl, opened the door of his cab, and leaned out to watch the configuration. When the silent object had crossed the road ahead, he had estimated that it was less than 300 feet away. The truck driver told me later that he had been frightened by the experience.

Other reports I had received during the spring were just as mysterious. But these persons could have been mistaken. There must be some rational explanation, I had thought. Could the truck driver have seen a helicopter? I wouldn't be convinced until I had experienced a bona fide UFO sighting for myself.

We decided that we were as far north as our search should take us. "Jim," I said, "on the way back, fly over Clearwater Lake." In a few minutes, we were over Clearwater Lake and Dam, nine miles west of Piedmont. The left arm of the lake extends northwest toward Ellington, while the longer arm reaches some fifteen miles to the north. There were a few boats scattered about the surface. From the air, the blue lake appeared bottomless.

We flew south from Clearwater Dam, following the Black River valley. Approaching the small towns of Leeper and Mill Spring, we spotted what local inhabitants call the Brushy Creek area. Here too, I had seen white balls of light drifting through the night sky at low altitude. I was still not convinced that there were things that deserved to be called UFOs. But this night of May 11 was to change everything. Before I returned to earth, my rational beliefs would be shaken to their very foundation.

At eight o'clock, I asked Jim to turn back to Clearwater Lake. According to the *American Ephemeris and Nautical Almanac*, sunset was 7:58 P.M., but we were not to enjoy the beauty of a sunset seen from the air. Many miles to the west, a dark, ominous cloudbank hid the setting sun. But in the Piedmont area, the sky was clear. There would be no immediate change in the weather.

"Let's go up north of the dam," I requested. "I want to find out whether the lights come from the ground, horizon, or sky. I just hope we see some tonight."

"O.K., Dr. Rutledge, whatever you say," Jim replied.

"Go up to four thousand feet," I said. "The lights I saw before weren't much higher than thirty-five hundred feet. I want to look down on them to see if they look the same as they did from the ground. If we decide to chase one, we'll have a downhill start."

"Yeah," Drake interjected. "We'll have a downhill start, all right. If we have to run, we might need it!" We laughed at that remark.

Headed north at 100 miles per hour, we could see ground lights being switched on in small towns and the stubby beams of car headlamps moving along roads and highways. The denser traffic on U.S. Route 67 caught our attention. Through the airplane's windshield, I began scanning the entire ground, horizon, and sky in front of us with binoculars. The predetermined scan pattern consisted of slow horizontal sweeps back and forth, starting at the left bottom of the windshield. I raised the binoculars a few degrees on each sweep, until the last sweep was across the top of the windshield, left to right. After returning to the lower left portion of the windshield, I initiated a repeat pattern.

The sky was turning a darker blue. Astronomical twilight would persist until 9:40 P.M. so that any object in the sky would be well illuminated. As yet, no stars were visible.

At 8:10 it happened.

"Hey, fellows! I believe we got a friend up there," I said, holding the binoculars steady. "I sure *hope* he's friendly."

"What is it?" everyone shouted, almost in unison. "What do you see?"

I described a small, pulsating light that had suddenly appeared in the sky, seemingly many miles away. Because I had been making a last sweep across the top of the windshield, I knew that the light was high in the sky above us, about 45° . The azimuth (compass direction) to the light was 20° right of our heading, due north. The alterations in intensity (pulse rate) were about one per second. Since the light had switched on in the upper left of the binocular field, I left the light there (Fig. 5.2). The observation of the single, pulsing light through my binoculars continued for at least ten seconds.

"There's another one!" I exclaimed. "It's blinking too. There was nothing there before. It just switched on!"

In my binocular field of seven degrees, the two lights were separated by about six degrees: the first light was in the upper left of the binocular field and the second in the lower right. I continued the observation for another ten seconds or so, while the lights took turns pulsing. First, one would pulse three or four times; then, the other would seem to answer. In any event, the pulsations of the lights had no meaning to me. Surely, I thought, this is not some simple form of communication.

As I described my observation to the others, excitement mounted in the small cabin of the aircraft.

Suddenly, to my amazement, a row of seven lights came on in my field of view. While continuing to observe, I informed the others.

"Where? Where?" Jim shouted above the engine noise. The others began to shout also.

At the moment the row appeared, I thought: that's not the Air Force! Then it hit me: many of the stories dating from World War II might have a basis. A great wave of excitement overwhelmed me. Never had I experienced such exhilaration. UFOs really exist. And I was an eyewitness!

Soon the scientist in me made me begin more critical observation of the scene unfolding in the sky. I needed to gather all the information possible from this unexpected and incredible event.

There were nine lights in all. The first individual light I had seen remained stationary in the upper-left portion of the binocular field; the second individual light was still in the lower-right portion. They were no longer pulsating. The horizontal row of seven lights was centered between and somewhat above the two individual lights, but was not perpendicular to my line of sight. Instead, the row slanted away from me, right to left.

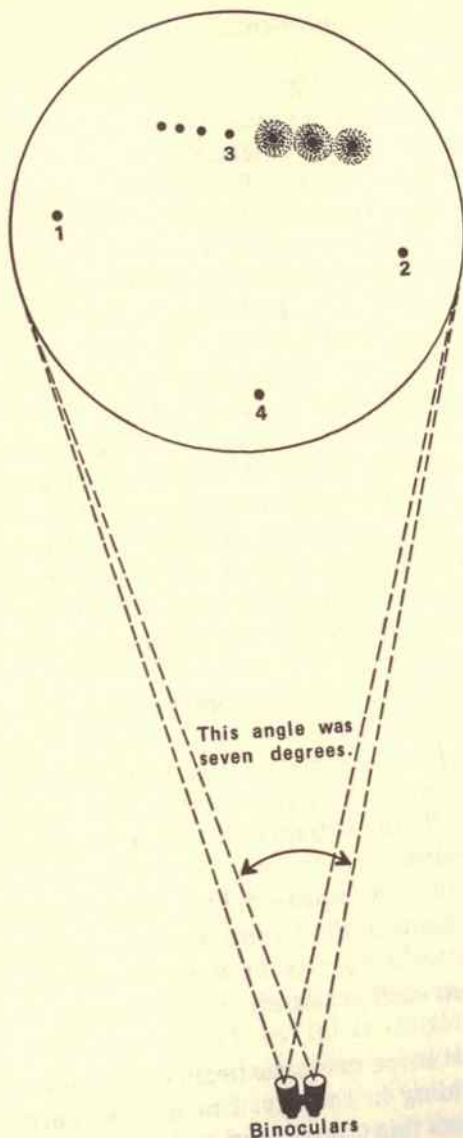


Fig. 5-2 Binocular view from an aircraft of 10 lights in the sky near Piedmont, Missouri. The order of appearance of the lights is numbered (8:10 P.M., CDT, May 11, 1973)

The seven lights in the row were not identical. The three adjacent lights on the right end appeared to be closer and were each surrounded by a peculiar, dark, cloudlike, shimmering haze. The density of the haze decreased outward from each light at its center. Occasional smaller lights streaked out of the central source of light, but they never reached the periphery of the haze. The appearance of each of the three lights reminded me of the "burnout effect" one gets on a television screen when a television camera is aimed at a bright light source.

The other four lights were farther away and seemed to twinkle and jiggle in position. I could see the broad, blue sky between the four lights, while the spheres of dark haze surrounding the first three lights almost touched at their peripheries. The first three lights were somewhat brighter than the last four, matching in brightness the two individual lights seen first. Had the haze effect been a physiological response of my eyes to the bright lights, the effect would have been confined to the two individual lights seen first, as well as to the first three lights in the row. In my opinion, I was observing an actual physical phenomenon.

Finally, heeding the shouts of the others, I removed the binoculars from my eyes and pointed in the direction of the observation. Jim made a corresponding course change to 20° right of north and increased our airspeed to the aircraft's maximum of 140 miles per hour. The only illumination inside the cabin was from a dim red light in the ceiling behind the visors. (The light's red color preserved night vision, yet allowed enough illumination to read the dials and gauges on the instrument panel.) Thus the *white* lights that I was observing in the sky could not have been reflected images of lights inside the aircraft. Nor, I was sure, could the scene have been the reflection of ground lights outside the aircraft. The lights in the sky were there. They were real.

Replacing the binoculars to my eyes, I exclaimed, "They are still there." The rest of the crew, not having binoculars, were unable to see them. Within seconds, a tenth light came on. It was below the other lights and pulsating.

Since the initial sighting, more than forty-five seconds had elapsed. A great transformation in my perspective had occurred. But then I realized I was the only one in the cabin to view the configuration in the sky. Who would believe such a story? I wondered.

Ten lights in a binocular field of seven degrees! Wanting confirmation, I handed the binoculars to Drake in the back seat. But when he couldn't locate the ten lights, I snatched the binoculars back

from him and made a futile attempt to relocate them. All I found was a vast, blue void. We continued to fly a search pattern in the vicinity of Piedmont while it got dark. I remained charged with excitement and was highly alert.

At 9:10, we were a few miles east of Piedmont, flying east at 3,500 feet. The airspeed indicator read ninety miles per hour. John, acting as our rear observer, was peering through the back window of the aircraft. Then, rather matter-of-factly, he announced, "Dr. Rutledge, a light is coming." Quickly he repeated the statement, except this time his voice rose. "It's coming toward us!" he screamed. "It's . . . it's coming right at us!"

Cold chills laced my back. I had visions of a very close brush, if not an outright collision. Perhaps, I thought, the object would circle our aircraft, causing electrical or engine failure. Such occurrences had been reported before when strange craft had come close to man-made vehicles. And we were over mountain terrain!

I told Jim to turn the aircraft, hoping to face the object head-on as it arrived. But when our aircraft turned, John could no longer see the light because his view of the sky had changed. Since he had been the only one to see it, we relied on him for a description. He described it as a fluorescent-colored white light that flashed at least four times per second in equal time intervals. Furthermore, he said that the motion of the light was "jerky"; that is, not straight and level as one would expect. By John's estimate, it had passed over our aircraft less than one half-mile above us. He concluded his description with a phrase that he would use throughout the summer: "Man, that thing was really honkin' on! That was no airplane!"

Fifteen minutes later, Jim commented that we were low on fuel and should head back to Cape. Everyone lapsed into silence. In spite of the rhythmic throb of the engine, I could not relax. Mentally, I was reliving my experience over and over and asking the obvious question: What is the probability that I could fly to Piedmont on a Friday night, observe ten lights apparently appear out of nothing, in a narrow binocular field, and then see them disappear?

The probability was small indeed; yet, it had happened. Unfortunately, I was the only crew member to observe the ten lights. In fact, Jim and Drake felt denied. They hadn't seen anything unusual during the evening except two excited cabinmates. Jim was somewhat skeptical about the existence of UFOs, although he believed that "something was causing sane people to report strange lights and objects in the sky." Drake had been my pilot during previous sightings; his skepticism had nearly dissipated.

When we reached the floodplain, we were less than 20 miles from home. Suddenly, I was startled by a light below and behind us that seemed to be pursuing our aircraft. The light seemed to flicker on and off as it paced our plane. Only moments later did I recognize the source: moonlight reflecting off intermittent pools of floodwater. The four of us laughed about that one.

After we landed, I instructed the others not to discuss the sightings with anyone except their immediate family members. As we walked toward the hangar, I said to Jim, "This has been a great experience for me; one I'll never forget." He didn't seem to appreciate my excitement. (For more than a year, as I approached that particular episode during public lectures, I had difficulty dealing with the emotion it stirred. Even now, the impact of the experience may surface without warning.)

While the plane was returned to the hangar, Jim completed the paperwork relating to the flight, then drove me home. Vividly I described the experience to my wife. To my relief, she never questioned my account. I slowly succumbed to sleep, believing that my life would never be the same.

During the weekend, my mind dwelt on the sightings. The research had now taken on a new significance, because determining the origin of the Piedmont UFOs would be more difficult than I had estimated. Although unwilling to abandon the hypothesis that UFOs were man-made, I now gave little credence to the theory that UFOs were a natural phenomenon.

After arriving at the office on Monday morning, I discussed the sightings with two of my oldest and most trusted colleagues in the physics department. Each had gone to Piedmont with me at one time or another; thus their names had been linked publicly to the study by news stories, both local and national. Dr. Sidney Hodges accepted my account, but Professor Milton Ueleke's response was more or less what I had expected: "What were you boys drinking Friday night?" I countered with what I considered cogent arguments concerning the reality of UFOs; in particular, the ones I had observed.

"Oh, it's probably something the Air Force is doing," he admonished.

"Perhaps you're right," I responded. "But why would the Air Force fly vehicles low at night and scare the devil out of truck drivers?"

Ueleke, who had been a navigator on a B-24 in the China-Burma-India theatre during World War II, countered by describing

how some bomber pilots had enjoyed buzzing Chinese junks in the Bay of Bengal. Also, he placed no validity in other persons' UFO reports. In contrast, I now found it easier to accept the many reports which had been arriving at my office from persons living in south-east Missouri.

After the debate with Ueleke, I vowed never again to try to persuade or dissuade people in their opinions about UFOs. I wouldn't become an "evangelist" but would simply file others' reports and present my own observations. That vow has guided me in my UFO research ever since.

Not until December 23, 1980, did Jim Trickey tell me about his own sighting on May 11, 1973. His paraphrased account follows: Nearing Municipal Airport on our return from Piedmont, Jim alerted the Flight Service Station of our approach and obtained wind conditions. We would land on Runway 28 (heading 280°).

Turning into the downwind leg of his approach pattern, Jim saw a light ahead, same altitude, azimuth 100°. To see if the light was moving, he kept his eye on it, saying nothing to the rest of us. The light, about a mile away and not far from the end of Runway 28 where we would descend, was soft white, large, and not as bright as an aircraft landing light. I did not see it from the copilot's seat; probably, I was looking down to the right at the lights of Runway 02, which we would soon cross over.

As Jim continued his approach, the light suddenly disappeared! Now he was even more concerned about a collision with another aircraft, since there was no control tower in 1973 to direct traffic. He radioed the FSS, but they reported no other aircraft in the area. Still concerned, he watched the former location of the light until we flew through it. But nothing was there. Making a 180° turn, he landed the Cessna 182.

In 1980, Jim said, "The light was simply there, and then it wasn't there." He ended his story by saying, "That sighting has bothered me all these years."

Now I understand his silent response to the statement I made to him as we walked toward the hangar that night.



PERPLEXING PHOTOGRAPHS

From April 6 through May 4, 1973, I had experienced twelve sightings. But after the May 11 sighting from an aircraft near Piedmont, my reluctance to label these as UFOs all but vanished.

Although the Project wasn't scheduled to move its headquarters to Piedmont until Monday, May 21, I decided to go there Friday night, the 18th, to see if any UFOs were about. After loading my car with equipment and picking up John Wilson at his home, I drove to a farm near the city limits on Route 74. After turning onto a rock-covered lane, we approached a home in a rustic setting among trees near the bottom of a steep ridge. We were there to pick up Robert L. Adams, who had told John that he would help in our UFO field research because our approach was scientific.

Out of the house came a man of medium height, husky build, and black hair. Around his neck were slung a camera and a black leather case obviously containing binoculars. In his left hand he carried a larger black leather case containing—I presumed—more optical equipment. Because of the paucity of equipment and shortage of manpower in the Project, Robert was a welcome sight. He was wearing a grin, and his handshake was firm. After he got into the car, the three of us left for Piedmont.

As Robert talked, I knew I would like him. He said that he farmed 350 acres of rich Mississippi River bottomland, that his wife Lela was an elementary school teacher at Benton, and that he had two sons, Doug and Jim. I learned of his deep interest in astronomy:

he had founded the Southeast Missouri Astronomy Club years before, and had designed his own home with two-story-high windows—to view the night sky. Because of our conversation, the trip to Piedmont seemed much shorter than usual.

On arrival, we checked in at radio station KPWB, then went to Pyle's Mountain. I parked the car by the concrete slab near the peak so that we could use the car as a platform on which to lay cameras, binoculars, and support equipment. Bob laid his United 15 X 65 binoculars on the roof; the large objective lenses were ideal for night viewing. From the large leather case Bob withdrew a lens, 800 mm in focal length and four inches in diameter—actually a refracting telescope. He mounted the lens on a Davis and Sanford tripod I had brought, attaching his 35-mm Pentax camera to the lens. (A 35-mm camera uses film that is 35 millimeters wide. The camera body can be attached to any one of a number of lenses of differing focal lengths, the most popular lens being one of 50-mm focal length—about two inches.) The yard-long system mounted on the tripod looked like a small cannon. It would be easy to aim directly over the long barrel, much easier than with a Questar telescope.

I laid my own 35-mm Pentax camera, a Polaroid camera, and Empire 10 X 35 binoculars on the roof of the car. Because darkness was more than an hour away, I didn't bother to remove the equipment from its carrying cases.

Within minutes, a car approached our position, stopping on the opposite side of the line of trees. A man, woman, and three girls approached. The man identified himself as Carl Campbell of Webster Groves in St. Louis County. Returning from a vacation, the Campbells had elected to come through Piedmont on their way home in hopes of seeing a UFO.

As we talked of our families and other things, darkness approached. Unknown to me, Bob had noticed a dim light to the southeast. "What the hell is that?" he asked John. "Let's walk over to the other side of the trees and watch it."

At first glance they thought it was a planet, but no planet was supposed to be in that region of the sky. To them, the light did not appear to be moving. After about two minutes, it began to brighten and approach. Bob and John ran back toward the concrete slab. "Dr. Rutledge!" John yelled. "There's a light! A light is coming!"

Looking through the line of trees, I saw an amber light approaching. Because there would not be time to adjust the settings on the more complicated Pentax camera in the semidarkness, I grabbed the Polaroid camera. John grabbed the 12 X 65 binoculars

and ran to the other side of the line of trees, the Campbell family following. Bob manned the 800-mm lens-camera system while I removed the cover from the Polaroid.

The light approached our position directly from the south-east, traveling a compass bearing of 298° , perpendicular to the line of trees in front of us (Fig. 6.1).* From our position on the concrete

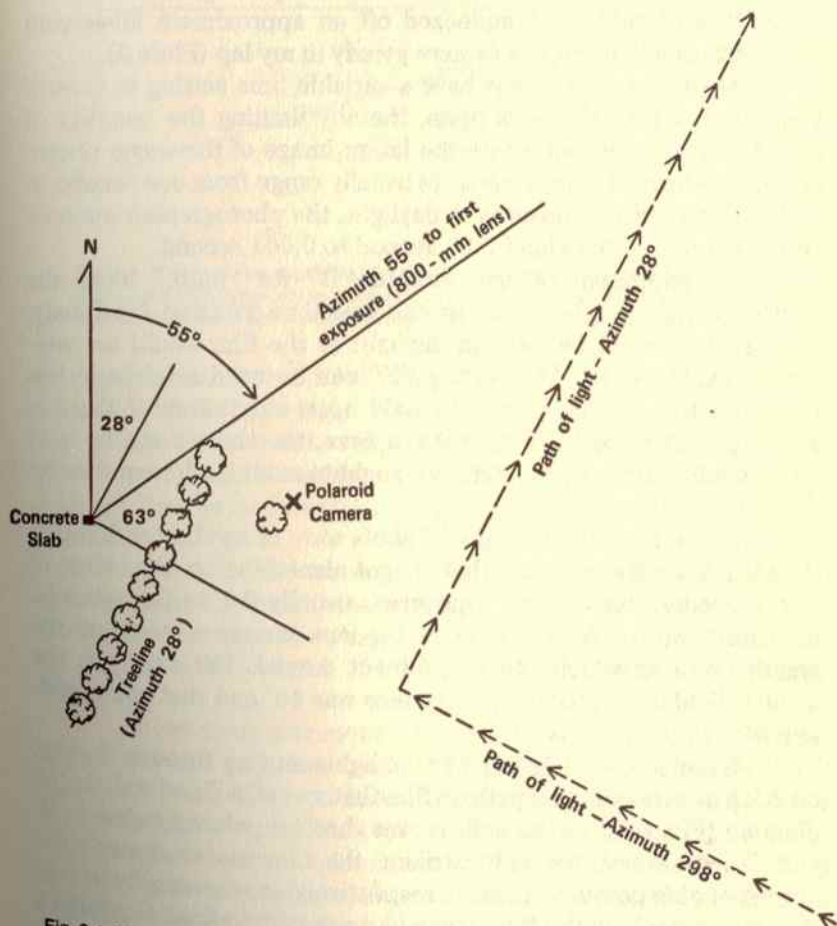


Fig. 6-1 The dashed line represents the path of the light as seen by observers on Pyle's Mountain

*In 1968, the magnetic declination at Piedmont was 5.5° east.

slab, 55 feet from the trees, Bob and I watched its apparent rise through one of the trees as it approached. Expecting it to pass over our heads, we waited for a clear view. Instead, it turned abruptly, appearing to travel a course parallel to the line of trees.

As the light moved, it continued to be masked by the line of trees. While Bob waited approximately one minute for the light to come into full view, I ran to the other side of the line of trees, sat down against a lone tree, asked one of the Campbell girls to move out of my line of sight, and squeezed off an approximate 20-second exposure while holding the camera steady in my lap (Plate 3).

Most 35-mm cameras have a variable time setting to control the duration the shutter is open, thereby limiting the quantity of light falling on the film where the latent image of the scene photographed is formed. These settings usually range from one second to 0.001 second. For exposures in daylight, the photographer chooses settings usually from about 0.01 second to 0.001 second.

An additional setting, labeled "B" for "bulb," locks the shutter (or light gate) open for any desired time duration. Obviously, this setting cannot be used in daylight or the film would be completely overexposed. The setting "B" can be used at night in low light, but the shutter cannot be held open indefinitely if there is moonlight. In a totally dark room or cave, the shutter can be held open indefinitely because there is no light to enter the lens and strike the film.

In the Project, our "quick" shots were of no shorter duration than 0.1 second—to insure that we got something on film. Most of our exposures were time exposures, usually 10 to 30 seconds, depending on the field of view of the lens-camera system and the angular rate at which the light/object moved. For example, the angular field of view of my 50-mm lens was 46° and that of the 800-mm lens only 3° .

Usually the exposures were of lights moving through the sky, creating a corresponding path on film that we call a [light] trail. In the diagram (Fig. 6.2), as the light moves through points labeled A, B, and C in the sky, the light striking the film moves through the corresponding points a, b, and c, respectively. In essence, the light in the sky "writes" on the film, much like a person walking alongside a blackboard and holding a piece of chalk steadily against it.

In this case, to keep the shutter open, I held my finger over the electric eye. Although the camera contained black-and-white Polaroid 107 film, I had intentionally set the camera to "color" to

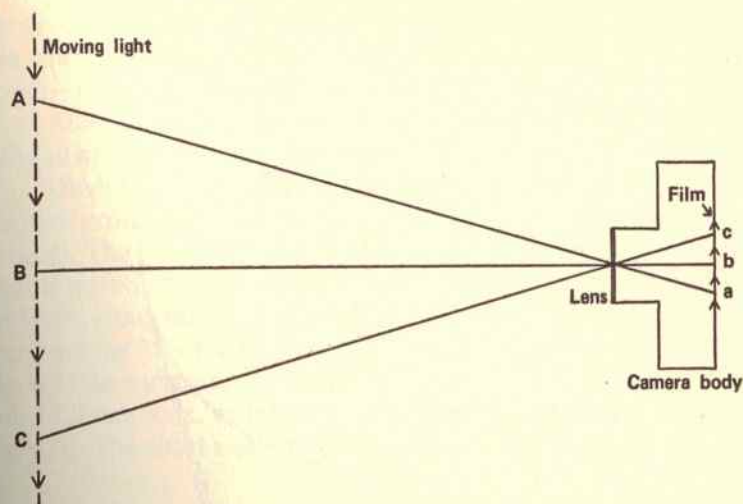


Fig. 6-2 During a time exposure, the shutter in the camera is held open while the moving light in the sky records a corresponding trail on film. The image moves across the film in a direction opposite to the light in the sky

change the f-number to $f/8.8$ from $f/42$, normal when using Type 107 film, ASA 3000, in daylight.

When I returned to the slab, Bob was completing his fourth time-exposure. Bob was elated. "I got him in the 800!" he said. He told me that he had used exposure times ranging from four to six seconds.

John, who had observed the light through binoculars just before it turned, when it was closest and brightest, was very excited. He had seen a ring with a shaft through it, both the color of neon light (Fig. 6.3). In his opinion, the space inside the ring was not solid material.

An amateur astronomer for many years, John was familiar with lens flares and their causes.¹ Also, he knew that an astigmatic eye produces a distorted image on the retina because his left eye was astigmatic—a condition for which he wore prescription glasses. Since his right eye needed no correction, he made a lens-flare test by focusing and defocusing while looking through each binocular lens separately with his right eye. As a check, he repeated the process using his left eye. He concluded that he was not observing a lens flare.

But John's observation didn't present the only enigma. The tree through which Bob and I watched the light approach served as a

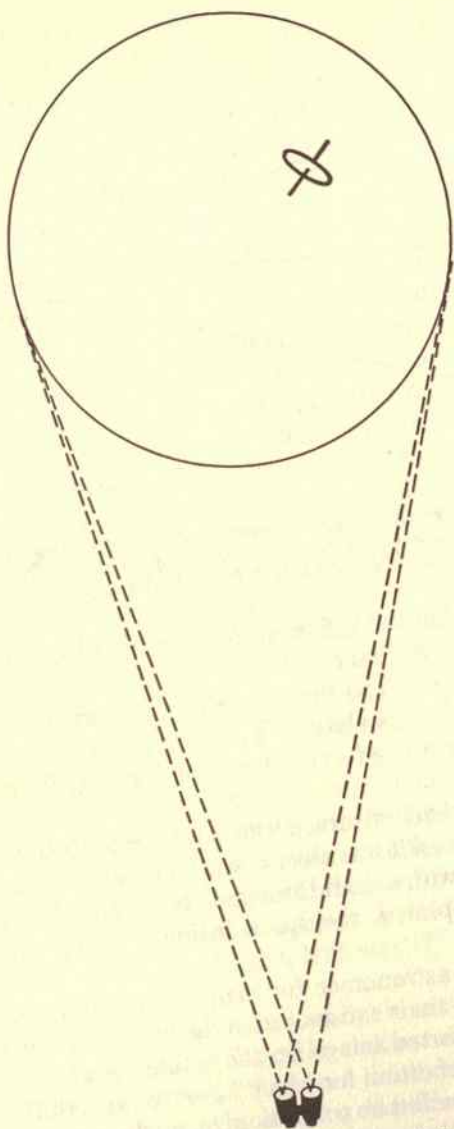


Fig. 6-3 Binocular view of the UFO light

reference point, so the motion of the light was easy to detect. The time duration for the light to make a right turn was about one second—rather quick, even for a helicopter.

After the film was developed and after exposures were analyzed and compared, other enigmas were found.

Obvious is the dissimilarity between the pattern of the Polaroid print (Plate 3) and the pattern of Bob's first exposure (Plate 4). The Polaroid print exhibits a relatively long line or trail of light, a series of short straight trails stacked in the shape of a sombrero, along with a number of light patches. The entire pattern is strung out for 39.1 millimeters in the upper-left portion of the print. (Fig. 6.4). In contrast, the pattern of Plate 4 consists of a horizontal trail, 13.2 mm long, with two shorter segments above the main trail (Fig. 6.5). The short segment on the left joins with the main trail.

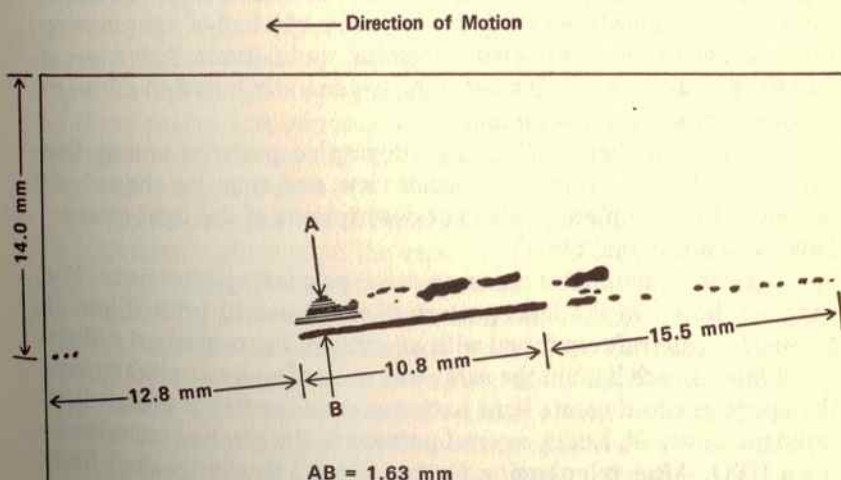


Fig. 6-4 This is a trace drawing of Plate 3 (Polaroid print) with measurements from the print. The length and width of a Polaroid print are, respectively, 95 mm by 73 mm

Not only is there a dissimilarity between the pattern shapes of Plates 3 and 4, but the maximum angular width of the Polaroid pattern is 13 times the maximum angular width of Bob's first exposure.

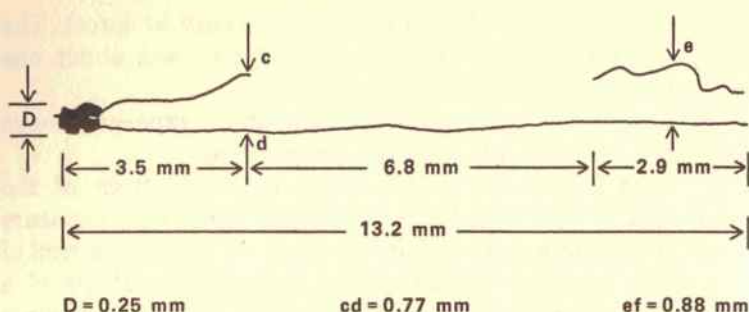


Fig. 6-5 This is a trace drawing of Plate 4 with measurements of distance on the negative shown. The length and width of a frame of 35-mm film are respectively, 36 mm by 24 mm

A dissimilarity exists between the single trails in Bob's three subsequent exposures (Plates 5, 6, and 7) and the pattern in either Plate 3 or 4. These three single trails on film of a ball of light moving through the sky are expected, including undulations that suggest minute vibrations of the lens-camera system, attributed to a breeze blowing across Pyle's Mountain.

Counting three differing photographic patterns among five exposures, counting John's binocular view, and counting the naked-eye view, five completely different descriptions of the light emerge. How does one explain this?

Even individual exposures raise perplexing questions. For example, how was the light pattern of the Polaroid print (Plate 3) formed? An aircraft equipped with an array of lights seemed a likely candidate. If each light in the array was controlled by a switch or key, the operator could create light patterns. An advertising aircraft flew frequently over St. Louis; several persons in the city had mistaken it for a UFO. After telephoning for two days, I finally reached Rich Kohm, president of Aeroads Company and owner of the advertising plane. He soon demolished my hypothesis: "We don't operate our advertising plane out of the St. Louis area," Kohm said. "We operate over Busch Stadium mostly. We would never fly as far away as Piedmont." When I inquired about other advertising planes, he assured me that no one else could have been at Piedmont because only thirteen such planes existed in the United States, the nearest in Chicago.

In Bob's first exposure (Plate 4), two pulses of light occur above the main trail of light. The first pulse starts at the extreme right of the four-second exposure, and the second pulse ends on the extreme left. The photograph portrays the actual motion of the light

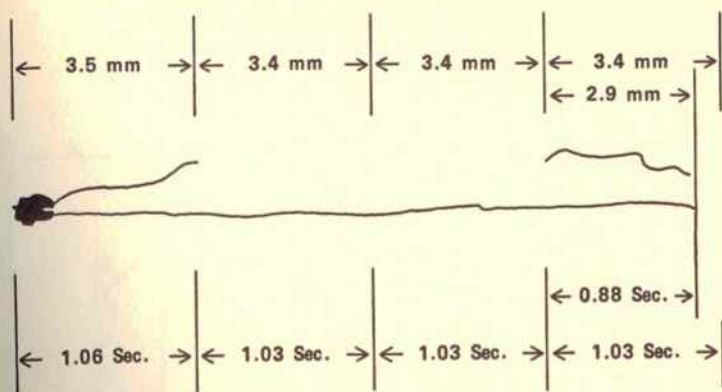


Fig. 6-6 Division of the light trail of Plate 4 into time segments

in the sky, right to left. If the exposure trail is partitioned into four intervals, the upper light appears to have been on for almost one second, off for two seconds, and on again for about one second (Fig. 6.6). Yet the pulsing light recorded in Plate 4 did not appear in the three succeeding exposures. John did not see the pulsing light through binoculars, nor did any of us see periodic brightness variations with our naked eyes.

An obvious feature of Plate 4 is that the first pulse of light at the beginning (right side) of the exposure is less bright than the main trail below, while the second pulse, on the left, is brighter than the main trail of light. We measured the brightness variations of the light patterns in Plate 4, using camera model 700 SU image scanner (Spatial Data Corporation) and computer model PDP-11/50 (Digital Corporation)—a computer-controlled image scanner in the Department of Bioengineering at the University of Missouri in Columbia. The graphs, drawn by a Hewlett-Packard 9820 calculator, are shown in Figs. 6.7a, b, and c. Although the variations in brightness are obvious in the photograph, the graphical plot using numbers from the computer scan, shows the variations on a quantitative basis.

Bob's first exposure (Plate 4) exhibits structure at the left end of the trail where the pulsed light appears to join the main trail. In fact, the junction structure is so well defined (Plate 8) that a scientist at the Institute of Optics in Rochester, New York, suggested that I need not attempt to sharpen the image by optical Fourier transform methods. He was as perplexed by the light pattern as I was. A tracing of Plate 8 appears in Fig. 6.8.

Although the structure on the left in Plate 4 is well defined, the presence of a spike of light raises the question as to the exact

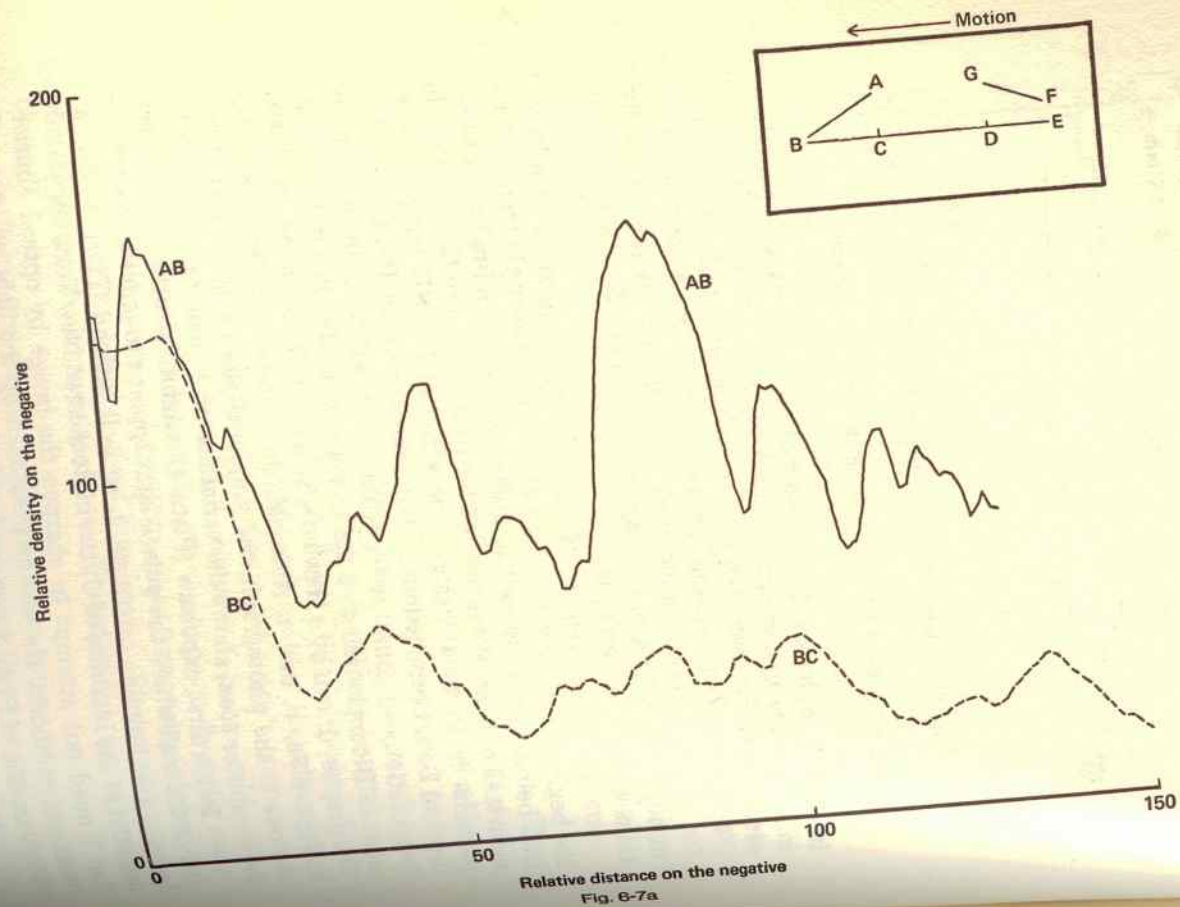


Fig. 6-7a

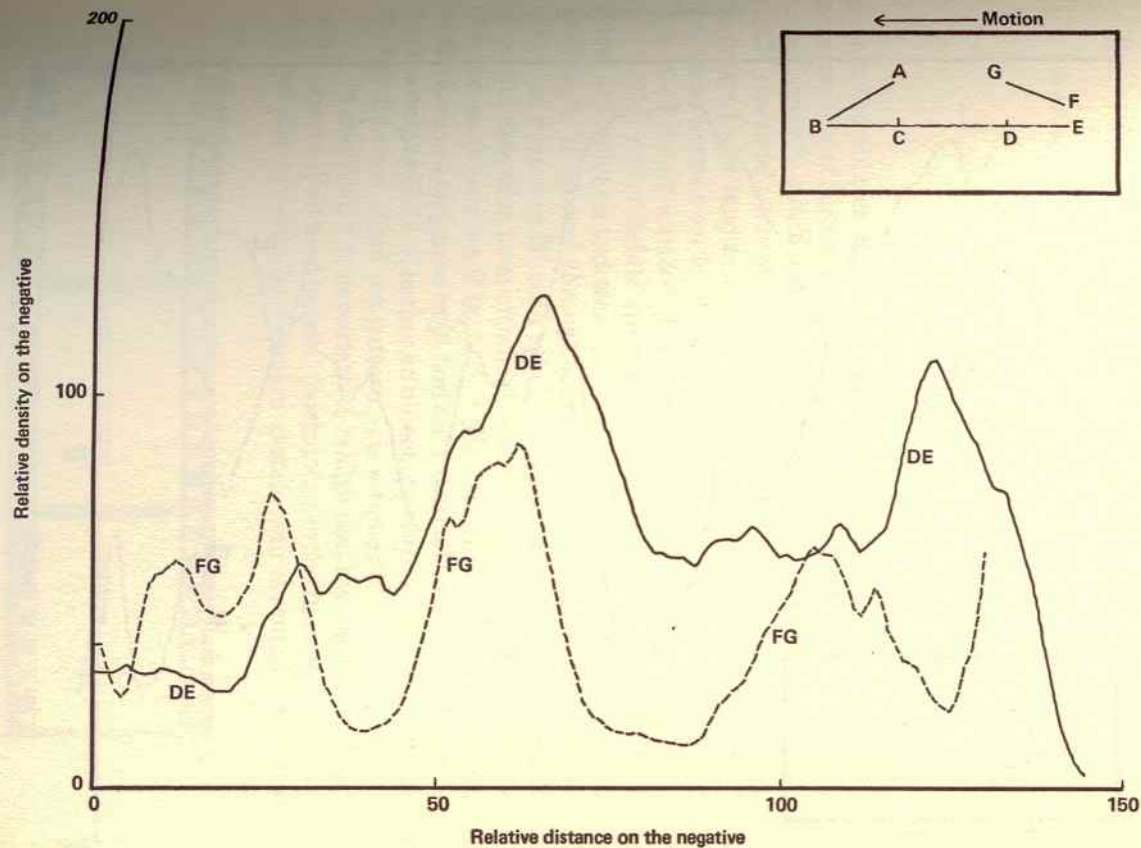


Fig. 6-7b

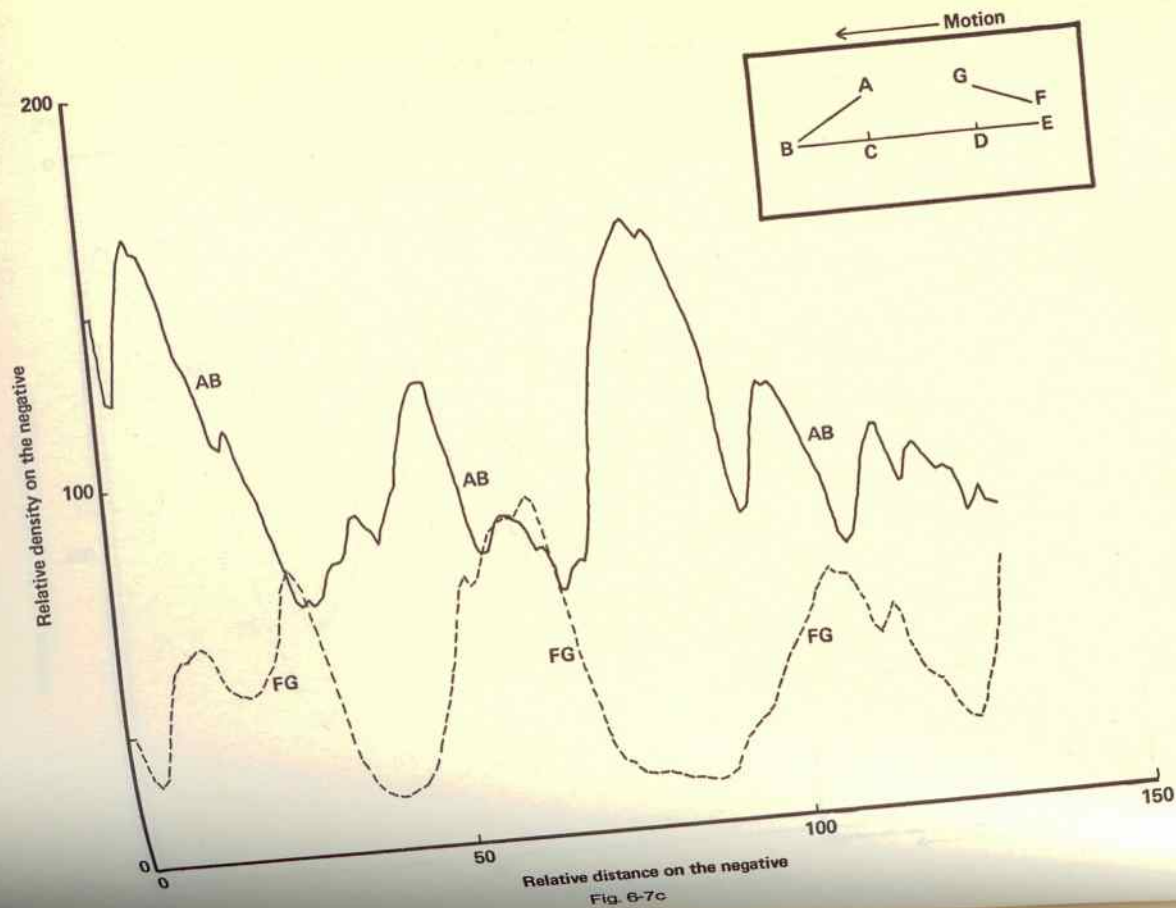


Fig. 6-7c

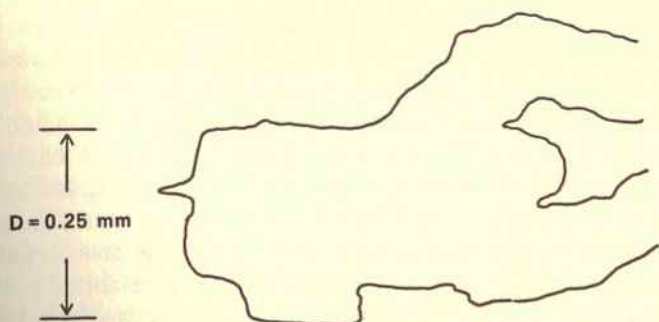


Fig. 6-8 This is a tracing of Plate 8

instant the shutter closed and the exposure terminated. Does the spike represent further motion of the light in the sky, or is it simply a crystal-growth mechanism created during the development of the film?² The focal plane shutter, used in this type of camera, can cause an image to be lengthened or shortened under certain conditions.³ For these exposures, however, the camera was operated on setting B; hence I do not attribute the spike to shutter action.

The rather subtle enigma suggested in Bob's first exposure (Plate 4) involves a technical explanation. When an object moving in level flight is viewed through a restricted aperture (camera, telescope, or even a cardboard tube), the approaching object will first appear to rise, then level off when closest to the observer, and finally descend as it recedes (Fig. 6.9). A similar effect is seen if electric power lines are observed from horizon to horizon in areas such as flat deserts or lake beds. Whether an object approaches from the right or the left does not affect the pattern; it is symmetrical.

In addition, it is important to realize that the back lower edge of the camera remained parallel (horizontal) to the flat concrete slab, and that the 800-mm lens camera system was mounted on a very

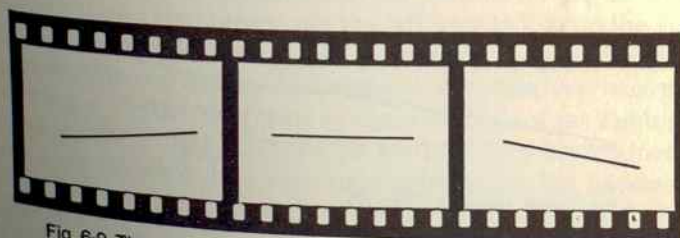
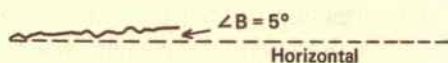


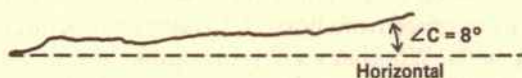
Fig. 6-9 The drawing represents a typical film record of a light moving horizontally in front of a camera during three short time exposures. The light is closest to the observer during the exposure in the center frame. The direction of motion is left to right or vice-versa

stable tripod. Yet the trail in Bob's first exposure (Plate 4) is *horizontal*, indicating that the light, approximately one minute after we observed it make a right-angle turn on its approach to the line of trees, was traveling perpendicular to the lens axis. But the light was going away from us, not across our front. For that to happen, a second turn was necessary; it didn't happen. According to Fig. 6.1, during the first exposure, the direction to the light made an angle of 27° with the path of the light, not 90° , as has to be the case for Plate 4. In other words, Bob's first exposure should have exhibited a downward slope to the left. Subsequent exposures (Plates 5, 6, and 7) show increasing downward slope, as they should for a receding light. (See Figs. 6.10a, b, and c.)

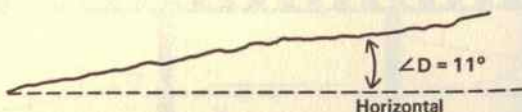
Motion: right - to - left



(a) Second exposure (Plate 5)



(b) Third exposure (Plate 6)



(c) Fourth exposure (Plate 7)

Fig. 6-10 These trace drawings show the increasing slope of the trails on the Kodak Tri-X negatives exposed through the 800-mm lens by Bob Adams

We didn't keep time during the sighting. I wanted to know if Bob's first exposure was taken before, during, or after my Polaroid exposure, so several years later Bob, John, and I returned to Pyle's Mountain to reenact our movements. Our best estimate is that Bob started his first exposure ten seconds after mine was begun, suggesting that his four-second exposure may have overlapped my twenty-second exposure. More than likely, his did not precede mine, because his exposure times ranged from four to six seconds, and because he was taking his fourth exposure when I returned to the slab. Nevertheless, my Polaroid exposure exhibits a slope downward to the left (Fig. 6.4), increasing in steepness from right to left as it should for a relatively long exposure through a relatively wide-angle lens (46°) as compared to the field of the 800-mm lens (only 3°).

To be thorough, I checked the possibility that an earth tremor might have rotated the concrete slab so that Bob's first exposure recorded as a trail of zero slope. No tremors occurred until a week later, the night of May 25, when we were in Farmington.

With regard to the analysis of slopes, I have assumed that the light did not change altitude while in our view.

Triangulation was impossible with only one viewing station, and no instruments (range finder or radar) were available, so the distance to the light could not be ascertained. But the angular speed can be calculated from Plate 4. In four seconds, the light traveled through an angle at the camera of 0.95° , corresponding to 13.2 mm on the negative (Fig. 6.5). The angular speed is 0.24° per second. If the distance to the light is estimated, a calculation of speed can be made. If the light was five miles away just after making its right-angle turn, then the speed when Bob made his first exposure was about 360 miles per hour; if only two miles away, the speed is about 144 miles per hour.

In an attempt to construct a rational explanation for what was recorded on Plate 4, suppose that we were observing an airplane. Then, the upper trail represents the left wing light, and the airplane is flying horizontally in a banked position (despite the fact that approximately one minute had elapsed since the very sharp turn). Assuming a 40-foot wingspan as characteristic of jet fighters⁴ and private aircraft,⁵ the distance to the lights, as ascertained from Plate 4, is certainly less than four miles when the exposure was made. This implies a distance of closest approach of less than two miles. However, we did not hear sound coming from the direction of the light.

If we assume that the lights were on a helicopter, the "wing-span" would have been much less, implying an even smaller distance of closest approach.

In conclusion, the enigmas remain. But despite the sharp turn, despite John's binocular view, and despite other enigmas arising from analysis, the sighting is rated Class B. Later experiences, discussed elsewhere and themselves enigmas, were to suggest an explanation as to how the light patterns were formed—explanations that are not very satisfying to me as a physicist.

After the light disappeared in the distance, we continued on watch. At 10:35 P.M., we had no difficulty distinguishing individual lights on an aircraft that came within a few miles of our position. Finally, at 1:30 A.M., we left the mountain for the long journey home.

During the rest of the weekend, I remained in Cape while Bob, John, and Bill Nanna, another member of SEMAC, went to Piedmont to observe from Pyle's Mountain on Sunday night. From the southeast an amber light approached—again, at 9:30. Again, it turned to the northeast. In contrast to our May 18 exposures of light trails, those of May 20 were not unusual. The report that UFOs were still in the Piedmont vicinity was exhilarating, for we were going there the next day as a group, as Project Identification. What adventure awaited?

NOTES

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C. B. Neblette, *Fundamentals of Photography* (New York: Van Nostrand Reinhold Co., 1970), ch. 4, 5.
3. Leonard H. Greenberg, *Physics for Biological and Pre-Med Students* (Philadelphia: W. B. Saunders Co., 1975), p. 181.
Lewis Larmore, *Introduction to Photographic Principles* (New York: Dover Publications, Inc., 1965), p. 8.
4. Fact Sheet, United States Air Force, Headquarters Aerospace Defense Command, Directorate of Information, Ent AFB, Colo.
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OPERATION INTERCEPT

Day One: Monday, May 21, 1973

Monday morning I awoke early, pleased that finally we were going to Piedmont as a scientific expedition to study UFOs in the field. At last, we would have ample personnel to set up more than one viewing station—and we would be in radio contact. At last we would have some sophisticated equipment, something more than a camera and binoculars. And Operation Intercept, a plan to intercept UFOs from the air, would become a reality.

My plan was simple. We would establish a radio network of three field teams of two persons each. One team would watch for UFOs at Pyle's Mountain; the second team would watch from the fire tower on Mudlick Mountain; and the third would wait by the Cessna 150 at the airport, ready to fly an intercept course if a UFO was sighted.

To allow the team in the aircraft to get to the UFO more quickly, I planned an early warning system. Persons residing in neighboring towns or outlying areas who saw a UFO were to telephone radio station KPWB in Piedmont, where someone would receive calls each night. This person would then telephone the team in the fire tower, who would radio the team at Pyle's Mountain and the team standing by the aircraft that a UFO was approaching from a specified direction. The team at the airport would take off immediately and fly a direct intercept course to the UFO, hoping to interact with it in order to acquire useful data. After arriving in Piedmont, I

would hire someone to receive calls at the radio station and would secure the cooperation of the media in neighboring towns; they would publicize my plan as well as KPWB's telephone number. Long-distance calls to the radio station would be paid for from the Project Identification fund.

To equip three field teams, five other persons besides me were needed. Each person was required to have training in the physical sciences and to bring his own camera and binoculars. Committed to the Project were Jim Sage, Drake Kambitch, John Wilson, and Mike Mudd, a physics major from the University of Missouri at St. Louis. I had written to several Midwestern universities to recruit help, but Mike was the only student who could make the arrival deadline of May 21. I was short one crew member. Although Drake's friend, Steve Huffman, didn't satisfy the criterion for training in the physical sciences, he agreed to fill in as the sixth member of the field unit. Frank Horton, a Cape Girardeau businessman, who had majored in physics at the University, graduating prior to World War II, also volunteered to help.

To obtain data, we were taking a lot of equipment to Piedmont. The major items of equipment were detectors of electromagnetic radiation in three frequency ranges: (1) the visible region of frequencies; (2) the S-band radar frequencies; and (3) the range from one to 1800 megahertz (MHz). The optical equipment for the detection of visible light emanating from a UFO included the 800-mm lens camera system, three Questar telescopes with tripods (one setup for each field team), cameras, and binoculars. The S-band radar set, rented from a firm in Greenville, Mississippi, would be used to fix the location of a UFO, to determine the distance to a UFO, and to detect nonvisible UFOs that reflect radar frequencies. The spectrum analyzer would detect lower frequencies from about one megahertz to 1800 MHz. But there was still much to do before we left for Piedmont.

During the morning, I was busy checking equipment, arranging maps, making telephone calls, purchasing last-minute items, and conferring with Jim, who was as busy as I making his own preparations for three weeks in the field. Mike arrived from St. Louis at 10:30, while Drake and Steve were developing film exposed the night before at Pyle's Mountain. Unlike the patterns obtained on the negatives Friday night, these were just straight trails.

The entire field unit was not going to Piedmont the first day. Jim would leave as soon as his field equipment was ready for use,

and Drake would fly the Cessna 150 to Piedmont the next day if the runway was open. Jim had borrowed from the Cape Girardeau Civil Defense Unit a portable electric generator, needed to power the radar set and the spectrum analyzer. The generator, rated at 1.5 kilowatts, was a source of 120 volts at 60 hertz, about the same as obtained at a wall socket. In addition, he mounted on sturdy plywood bases three radio units, also borrowed from the Civil Defense unit—radios that operated on a frequency of 37.1 MHz, almost a private channel. Two of the radios were to be placed in cars, while the third was to be mounted behind the seats of the Cessna 150 to facilitate air-ground communications. Mounting the antennas was a problem, especially in the aircraft. Not only were radio communications essential for triangulation measurements to locate a UFO in the sky; they were needed also to coordinate field operations—to effect Operation Intercept.

At five o'clock, John, Mike, and I, the vanguard of Project Identification, arrived in Piedmont. As we approached on Route 34 the intersection with Route 49 at Main Street, we saw the Waltrip Motel on our right. On the marquee in front of the motel remained the message that had been there since mid-March: "Welcome UFO People," while the other side read "Piedmont is UFO Headquarters."

When I had arrived in April, the message was amusing; now, it had meaning. We were going to lodge at the Waltrip Motel; it would be our operational headquarters. To avoid being seen near the signs, we made it a policy to enter and exit the motel by the back entrance during daylight hours.

Our operational headquarters was half a white-frame house in the center of a U-shaped courtyard lined with motel rooms. Tall trees surrounded and secluded the motel. Other trees and a small, red-brick laundry house near our back door afforded a measure of privacy. Glenna Waltrip, who with her husband owned and operated the motel, led us to the back-door entrance.

We inspected our quarters and judged that they would be comfortable and functional. The entrance led into a kitchen containing a refrigerator in which we would store film, and a sink in which we could process it. The kitchen connected to two bedrooms and a bath. Fortunately, there was space for us to bring our valuable photographic and electronic equipment into the kitchen and outer bedroom at night after coming off watch.

John and I chose to occupy the small connecting bedroom, not realizing that we would be awakened by the other crew members'

late-night treks to the bathroom. But our room had one advantage; John and I could get up every morning about eight o'clock without disturbing the others.

Soon after we finished unloading the equipment and our clothing, Frank Horton arrived in his black Lincoln Continental. It contrasted with our University-owned car, a white 1970 Ambassador. We chatted awhile, then went to Lumsden's Steakhouse on Main Street. After a leisurely dinner and a return to the house to procure equipment for our first night on watch, we drove the length of Main Street, then followed Route 34-49 up Pyle's Mountain. Near the top, we turned right to enter an open gate leading to a landfill. A sharp right turn and a drive uphill over rough ground brought us to the line of trees.

On the northeast end of the line of trees was an entrance with an open gate not far from the concrete slab, our favorite viewing site. We would have almost complete sky coverage because John and Mike would set up about 150 yards away on the other side of the trees, on solid level ground beside the landfill. They could see that portion of the sky to the east that the line of trees blocked from our view.

After the setup and a long conversation, during which I got to know Horton better, I realized that our stay on the mountain would be abbreviated. A cloudbank had blocked the setting sun. A quiet calm was soon punctuated by the rumble of thunder to the west. I told Horton that we were going to be rained out the first night. After a long wait, we heard the wind roaring in the trees across the valley, warning us to leave the mountain. John encased his equipment while Mike held the flashlight. As I was dismantling my equipment, I caught a glimpse of John and Mike running toward us with their cumbersome loads.

At the exact moment I slammed the trunk lid, the storm struck, seemingly with more force than any I had ever experienced. Perhaps it was because we were atop the highest elevation in our vicinity. We drove through heavy rain to our motel. As Horton left for Cape in wind and rain, I worried about his safety.

Some time after ten o'clock, the storm abated. John and I returned to view on Pyle's Mountain, parking at the entrance to the landfill. We maintained our vigil under a heavy overcast; but a cold wind forced us to take turns observing while the other person sat inside the car with the heater on. Once when John was the outside observer, we both saw a patch of lightning in the west, almost rectangular in shape, that aroused our curiosity. After comparing

views, we established a policy: if one of us was observing an event, he would not describe it to the other person until the event had terminated. Then, if both of us had seen it, we would compare our independent observations. John and I were to work comfortably as a field team for several months.

Well after midnight, John and I left the mountain for the second time that night, in mist and fog that limited visibility. Although mildly disappointed, I thought of tomorrow and the implementation of Operation Intercept. In the morning, we would set out for neighboring towns to explain the operation to media persons and to ask their cooperation in publicizing it.

Day Two: Tuesday, May 22, 1973

After breakfast, John and I checked in at the radio station—an established ritual—where I explained Operation Intercept to Dennis Hovis. He suggested that Jeneal Bumpus might be interested in serving as the telephone receptionist each night at the radio station. In addition, she could type our daily reports while on duty, using the typewriter in the office there. Because the station went off the air at 7:00 P.M., the receptionist would need a key to the front door. Hence, Jeneal was an excellent choice because her mother owned KPWB. When I telephoned Jeneal at her home, she accepted the position.

Next, we went to the airport to check the runway. Tall timothy hay growing on the runway had been mown, as I had requested of city officials a week before. But to my chagrin, the hay had not been harvested. It had been raked into three parallel rows to cure. The three rows extended the entire length of the runway. In the center of the runway, a plastic sheet anchored to the ground with bricks formed a large "X," which, according to FAA regulations, warned any flyer not to land. The airport was closed.

Undaunted, John and I went to the office of Mayor Roy Anderson at the Missouri Farmers Association. He was adamant, saying that the city attorney had advised him not to encourage us to use the airport because of possible legal complications. The FAA had officially closed the airport on January 1, 1973; yet the large "X" had been placed on the runway recently. Anderson warned that our aircraft might endanger children on a playground near the south end of the runway. I suggested that the city attorney draw up a disclaimer statement, but the mayor did not believe that the document would be legally binding. After much persuasion, he relented, saying that we could use the runway at our own risk. In addition, he

promised to complete the hay harvest. He offered us the services of the city-owned jeep and suggested the premises of the city water tower as a viewing station. Few persons would bother us there, he said.

After we left his office, I reviewed my puzzling conversation with the mayor. No legal document had been signed absolving the city in case we crashed. I concluded that his tactic was one of delay.

When we arrived back at the motel, a telephone message from Drake in Cape Girardeau helped us to determine our itinerary. He would fly the Cessna 150 to the vicinity of Van Buren, where he would land in a pasture. While we were discussing our plans for the trip, Mike decided to go with us.

Late in the morning, the three of us left for Van Buren by a circuitous route, planning to stop at Williamsville and Ellsinore to introduce the local media to Operation Intercept. Route 49 took us through the Brushy Creek area, where we stopped to take some daylight color exposures of the terrain in the vicinity of our viewing station on April 13. In Williamsville, we interviewed several persons who had had sightings, including Clifford Crites, one of the two men we had met at Brushy Creek almost five weeks before. I learned that southbound lights often turned near Williamsville to return north, and from this, I inferred that Piedmont was indeed a focal point for UFO activity. Clifford and his wife Helen agreed to publicize Operation Intercept in Williamsville. The southeast portion of our line of the early warning system would be functional.

Late sitting down to lunch, we left Williamsville at 3:30 for Ellsinore and Van Buren, our eventual destination, 34 miles away. Before we reached the intersection of Route 49 with Route 60, we were in a rainstorm. Because of the heavy rain and the late hour, we didn't stop at Ellsinore. I was determined to be at that pasture, whose location we didn't know, to meet Drake. Too bad, but the southern portion of our early warning line from Williamsville to Van Buren would be missing.

The rain had stopped when we reached Van Buren, but a heavy overcast dampened our spirits. We went to the office of the local newspaper, where we met with the editor to explain Operation Intercept. As I talked, a look of incredulity clouded his face. He didn't believe a word I was saying and proved it by refusing to run a story about my plan in the newspaper. I didn't pursue the point; we simply left.

From a passerby we received directions to the pasture that

served as the local airfield. I doubted that we could find it, but we did locate the designated side road. As we drove, the road degenerated and the hills got longer and steeper. We were about to turn back when we cleared the top of a hill. Below and to the left, a verdant valley spread before us. A stream meandered through the valley, creating a scene of natural beauty. After the cleansing rain, the various shades of green grasses and foliage contrasted beautifully. Across the stream, we had been told, was the pasture that doubled as a landing strip. But there were no aircraft on the ground and none in the sky—which was beginning to darken.

At the top of the hill, we turned left, went through a gate, turned right, and followed a deeply rutted lane that descended steeply for at least one half-mile. I kept the Ambassador in low gear, using steady pressure on the brake pedal. Near the bottom, the hill was steeper and muddier. Whether or not we would escape the valley I didn't know, but we had committed ourselves.

After we reached the bottom, I could find no access to the pasture in the distance. The stream was not bridged. Nevertheless we waited. One half-hour beyond the rendezvous time, we had to leave because of impending darkness. If we could negotiate the first incline, we could make it up the rest of the way. With John and Mike pushing, the Ambassador easily climbed the grade. I stopped to pick up Mike and John. With great relief we reached the top of the hill and left the valley.

When we arrived back at the Waltrip Motel, I was in a bad mood—which suddenly worsened. At the motel office was a message from Jim, who had come to Piedmont from Cape, informing me that Drake would not arrive at Van Buren as planned, but would land near Ellington, 52 miles northeast of Piedmont. Jim had gone to pick him up, but Drake did not show up there either. When Jim got back from Ellington, I told him that I was very glad to see him. Both of us were upset that Drake had us looking in obscure pastures over a large portion of southeast Missouri for a small aircraft that had never left Cape Girardeau.

Again, we set up two viewing stations on Pyle's Mountain; again viewing conditions remained poor most of the night. On three occasions we easily identified aircraft by their navigation lights and flashing anticollision lights. Each could be seen for approximately ten minutes after passing our position. We left the mountain at 1:30 A.M., driving home in dense fog—a fitting climax to a disappointing day.

Day Three: Wednesday, May 23, 1973

After breakfast, Jim and John went to Cape Girardeau, where Jim procured the spectrum analyzer. Next, he notified officials in Greenville, Mississippi, to ship the rented radar unit so that it could be brought to Piedmont. He planned to place the radar unit on the south slope of Clark Mountain, a location inaccessible to automobiles, to forestall any risk of radiation damage to curiosity seekers. To complete his business in Cape, Jim recharged some car batteries Horton had loaned us.

Meanwhile, Mike and I went to the radio station to inform Hovis that we would continue to implement Operation Intercept by visiting towns to the north on Route 49. Already the day was off to a poor start: a thunderstorm was in progress. While at KPWB, I received a telephone call from State Representative Jerry Howard. Just as I said "Hello," a nearby lightning bolt terminated the phone service. We left.

Our first stop was Des Arc, a small town clinging to the steep slope of a mountain of the same name. Mrs. Jackie Ruble, a local store owner, described a large red ball of light that had passed silently over Des Arc in March. Apparently, the light was attached to a craft, because she saw red light reflecting from a metallic surface. A few minutes later, she said, it returned from the direction of Vulcan, joined another red ball, and the two left together. "It scared me," she said. "I wouldn't go out at night."

One twenty-year-old man had seen a lot. In late February, he saw a lighted vehicle in a field near a "TV cable tower" close to Piedmont. Many other persons saw it, according to the man, and when he returned to Des Arc four hours later, it was still there. He told me that he had watched the antics of lights in the sky since he had been in the third grade. More than once, lights had followed him and his friends. In a recent incident, he had been riding with a friend, who "drove ninety" to get away from an aerial vehicle that seemed to pursue them for some distance.

An elderly man described an incident that interested me because of its recent date. On May 19, he had observed a white light approaching from the north "like it was struggling." Then, a second light approached from the south. The two lights met and stopped. After a minute or so of hovering, one light went out; the other moved away. He said, "Just as it started to leave, three lights appeared. It looked like one of the lights had come up, unloaded from the other, and hatched some new ones." I recalled Maude Jefferis's observation of a hovering light she called "Grandpa" until, one night, a

light exited from it, prompting her to rename the light "Grandma."

A housewife related an interesting experience with what seems to have been ball lightning. During a thunderstorm, a "ball of fire" had entered her home through a keyhole, bounced on the floor, and disappeared with a loud report. The whole affair had frightened her. I assured her that she had observed an infrequent but natural phenomenon.¹ Indeed, some scientists believe that ball lightning and corona discharges are the sources of UFO reports.² Some of the accounts I heard in Des Arc reminded me of Ozark tales of "spook lights" and "ghosts" that seemed indigenous to the region.

After a brief stop in Sabula, we ate lunch in Ironton. Next, we visited the editor of the *Mountain Echo*, who told me that he would run an article about Operation Intercept—but the paper was a weekly and it was publishing day.

In Fredericktown, I talked to the editor of the *Democrat News*. He said that an orange light had been seen in the vicinity of Farmington, a town 17 miles to the north on Route 67. I was interested, but I was tired; it was 3:30 P.M., and we were 45 miles from Piedmont. Then I recalled the UFO-aircraft encounter of Ken Pingel and Marvin Colyer on April 12. Reluctantly, I decided to go on to Farmington. This decision ultimately ended my effort to establish Operation Intercept, but proved to be very productive because of two terribly strange nights that were to follow.

In Farmington, I met with the editor and publisher of the *Farmington Press*, Wit Ledbetter. He told us that Ron Short, owner of the Dicus Drugstore, had photographed the lights. We went immediately to the drugstore to tape-record his story.

A tall man, Short wore his light-colored hair in a crew cut, and he was very serious, the typical head of a city planning and zoning commission. Ledbetter had described him as "calm, alert, and observant," which he was. Short had three years' experience as an air traffic controller in military service, followed by FAA school for air traffic controllers, culminating in three more years in that position at Lambert Field, now called St. Louis International Airport.

On several occasions, Short had observed a light undergoing gyrations and sudden bursts of speed. He had first seen it one evening in early April while driving in the country. Now it was appearing five nights a week. Because we hadn't seen a single UFO at Piedmont since our arrival on Monday, I assured Short that a field team would return the next night.

"Where is a good place to set up equipment, Ron?" I asked.

"The best place is the airport," he replied. "There's a good

view there, and less light than anywhere else. Of course, you have the beacon there."

Mike and I left the Dicus Drugstore for the Farmington airport where we met Chuck Pingel, Ken's younger brother. Chuck told us about many personal encounters with UFOs while flying. Before we left for Piedmont, Chuck gave me permission to set up equipment across the runway to the east.

When Mike and I arrived back at the Waltrip Motel at six o'clock, Drake was there—without the Cessna 150. He had returned with Jim and John, and I was pleased. All were in the kitchen, Jim tinkering with the spectrum analyzer sitting on the table, creating intricate patterns of green lines on the oscilloscope screen. The others were working on the radios. We were beginning to *look* like a scientific field unit.

After dinner, Mike, Drake, and Jim went to the fire tower on Mudlick Mountain while John and I occupied the concrete slab on Pyle's Mountain. A heavy overcast hung at about 2,500 feet with surface winds at 15 to 20 miles per hour. This weather description constituted our total report for the evening. Three nights, and we had no data! But that situation was about to change.

Although Piedmont was our headquarters for two weeks, Project members had set up equipment at Farmington, at Williams-ville, and in Sam A. Baker State Park. During the first week, Wilson and I left the main group at Piedmont and went to Farmington to observe for two consecutive nights—nights punctuated by experiences so bizarre that I have labeled them "A Terribly Strange Night" and "A Second Terribly Strange Night" after the title of the story *A Terribly Strange Bed* by the nineteenth-century British author Wilkie Collins. Of course, our experiences were not fiction.

NOTES

1. Leonard B. Loeb, *Electrical Coronas, Their Basic Physical Mechanisms* (Berkeley and Los Angeles: University of California Press, 1965).
2. Philip J. Klass, *UFOs Identified* (New York: Random House, 1968).



A TERRIBLY STRANGE NIGHT

Day Four: Thursday, May 24, 1973

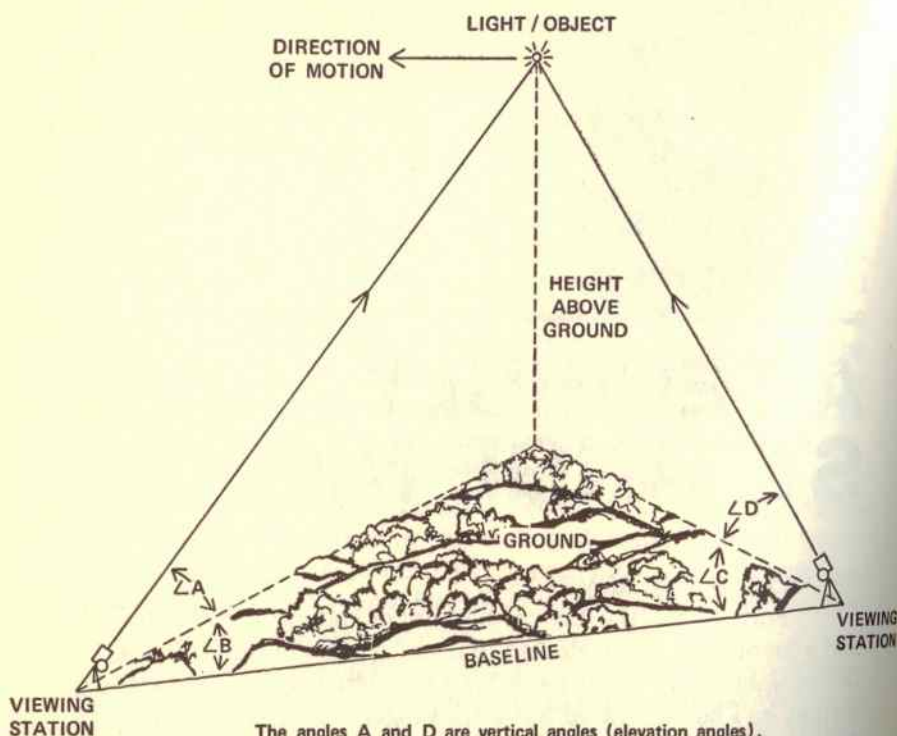
Fortunately, the day dawned bright and sunny, for Jim Sage had a lot of work to do. He had to install a radio in the Ambassador before John and I could leave for Farmington to set up a viewing station, as I had indicated to Chuck Pingel the afternoon before. In addition, he had to install the spectrum analyzer in the fire tower on Mudlick Mountain. An antenna for the spectrum analyzer would be needed, too. This equipment, as well as a 37.1 MHz radio and 12-volt car batteries, would have to be carried to the top of the 100-foot tower. The third team would take a radio to Pyle's Mountain.

Now that they had radios, the two teams in Piedmont would be ready to make triangulation measurements—for which a minimum of two stations is needed.

An imaginary line connecting the two stations is called a baseline (Fig. 8.1). The vertical angle (angle of elevation) at each viewing station is measured with respect to a horizontal plane (Fig. 3.1). If one viewing station is higher than the other, this difference must be taken into account.

The horizontal angle at each station is measured with respect to the baseline, whose compass direction (azimuth) is known. The horizontal angle itself may be regarded as the azimuth to the light/object with respect to the baseline.

Of the four angles measured at the two viewing stations, only three are necessary to calculate the position of the light/object. The



The angles A and D are vertical angles (elevation angles).
The angles B and C are horizontal angles (azimuth angles).

Fig. 8-1 Location of a light/object in the sky by triangulation. The four angles must be measured simultaneously

fourth angle can be used as a check on the calculation. Since all angles must be measured at the same time at each location for a moving light/object in the sky, radio or telephone communications are essential.

After breakfast, Jim telephoned Cape Girardeau and learned that the radar unit would be shipped by truck from Greenville, Mississippi. Because yet another person was needed to complete a third field team, Jim telephoned Steve Huffman, asking him to come to Piedmont. Steve arrived later that afternoon in his dark blue Corvette, bringing his own camera and binoculars.

At 4:30, John and I left for Farmington, hoping to maintain radio contact with our base at Piedmont, a distance of about 50 air miles. Unfortunately, we lost radio contact a few miles out of Piedmont.

After dinner in Farmington, we drove to the airport. Chuck Pingel opened a gate, allowing us to drive to the east side of the

runway, where we parked near the wind sock. We were as far as possible from the rotating beacon light. Farmington lay less than a mile to the north. I placed a transistor radio on the car roof to listen to radio broadcasts. If a UFO were nearby, there might possibly be electromagnetic interference in the AM radio band.

"What is the ceiling of this overcast?" I asked John, after he had set up the 800-mm lens camera system on a D & S tripod.

"I'd guess about six or seven thousand feet," he replied. John had taken a course in meteorology at the University. So had I at another college many years earlier, in 1946.

Later the owner of the airport, Ralph Pingel, father of Ken and Chuck, walked over to chat. He and his two sons had joined the growing ranks of flyers who had encountered mysterious vehicles in the sky. "There's something funny going on," he remarked. "I've been in aviation fifty years, and I've never seen anything like it. A lot of strange craft have flown over here."

Pingel's comments increased our expectancy. At 8:50 P.M., we listened to radio KXOK news; the temperature in St. Louis was 75° F. An occasional aircraft flew by or used the runway, including one airplane we recognized as a Cessna Skymaster. John photographed it taking off.

At 9:21, an eastbound airplane flew south of the airport. As it was receding in the distance, a stationary amber light came on almost southeast of the airport. It looked as if the hovering object had waited until the airplane had passed before making its appearance (Fig. 8.2).

"There it is, John!" I called out. "Take your time and get a good exposure. I'll help you."

John aimed the long-barreled 800-mm lens at the hovering light. The size of the image on film of John's exposure would be sixteen times larger than that made with a lens of 50-mm focal length. Hence, I didn't make an exposure. He was well into a one-minute exposure when a car approached from across the runway. (See Plate 9.)

"Kill those damn lights!" I shouted. "We're taking an exposure." Ron Short and Ralph Pingel got out of the car.

While we continued to observe, Short told Pingel, "That sure isn't any helicopter."

"We could hear it if it was," Pingel answered.

I removed a polarizing filter from my pocket and held it to my eye. While looking through it at the light in the sky, I rotated the filter through 360°. If the light was polarized, its brightness would

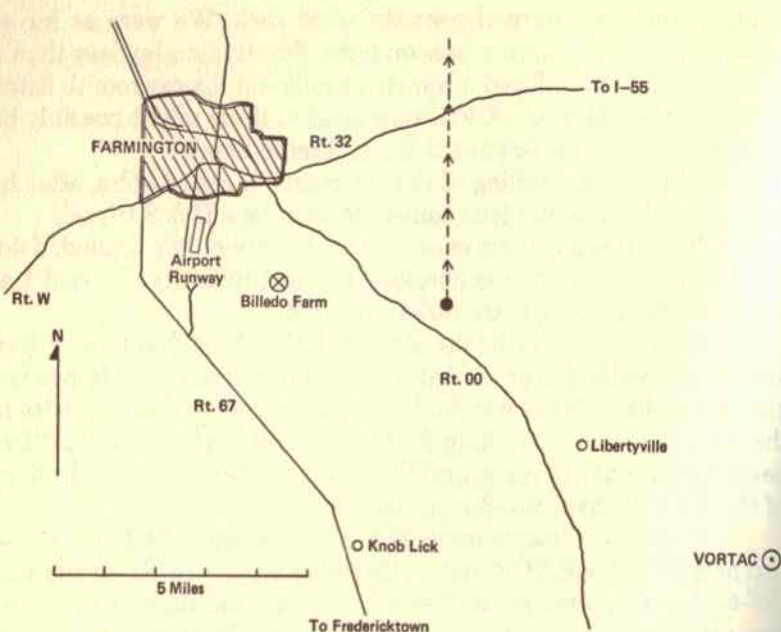


Fig. 8-2

vary as the filter was rotated. (To observe a familiar effect of polarized light, hold one lens of Polaroid sunglasses in front of your eye. While viewing the northern sky in daylight, rotate the lens, and notice two variations in brightness during one complete rotation.)

The light's brightness did not vary. On the other hand, the light reflected off the overcast from the hovering light *did* vary in brightness, telling me that the reflected light was partially polarized. The phenomenon is rather common when light is scattered from molecules of gas.

An airplane, barely visible in the fading twilight, approached from the west and headed directly toward the hovering amber light. When the airplane appeared to be within a mile or so of the light, from my perspective, the light went out. The airplane turned south and departed. I wondered why the pilot of the small airplane had not continued on toward his apparent objective.

As we watched and waited, darkness engulfed us. Soon an aircraft flew directly over the runway, headed in the general direction of the Farmington VORTAC station that is located 12.5 miles from

the airport at an azimuth of about 117° (Fig. 8.2). (A VOR station, at a known location on the ground, continuously broadcasts navigational signals on an assigned frequency in the 108–118 MHz range. Pilots receiving this signal in their aircraft can fly a desired course. VOR stations that also have distance-measuring capability are called VORTAC stations.¹) Because the aircraft was relatively low, its individual lights were easily seen.

"That sounds like a turboprop," Pingel said. "Yeah, you can hear the turbo sound now." Moments later, he added, "Look at that, Ron! He's got a red light on the right wing!" According to FAA regulations, the light should have been green. John got an exposure, but unfortunately, the film was black and white.

Later, what appeared to be the original hovering light came on in about its original position, having been off for 15 minutes. John was well into a 1-minute exposure when the light began to move north (Plate 10). In response to the movement, he cocked the camera and began a series of exposures of the moving light. During the middle of one 9-second exposure, he masked the lens for 3 seconds (Plate 11).

I rushed to the car, about 30 feet away, placed the Pentax camera with the 50-mm lens on the roof, and prepared to take my first exposure. Holding the camera firmly against the roof with both hands, I depressed the cable-release button on top of the camera slowly, to minimize camera movement, just before the light entered the camera's field of view. After the light had passed across the field of view, I terminated the exposure by slowly releasing the button (Plate 12). I made a second exposure using this same technique, also about a minute in duration, although the exposure time on film for both exposures may be somewhat less (Plate 13). Approximately three minutes after the light had begun to move, it disappeared over a ridge to the northeast. The four of us walked to the middle of the runway where we stopped to discuss the sighting.

Air traffic had ceased; all was quiet. By chance, I was facing northwest, in the direction of the city park bordering the airfield. A few persons were moving about the park, which was illuminated by mercury-vapor lights. Children were playing. Instinctively, I tilted my head upward—and what I saw will be etched upon my memory for life.

A configuration of four lights had just passed overhead. From left to right, they were white, red, red, and white—a symmetrical pattern forming a line perpendicular to the direction of motion. Each

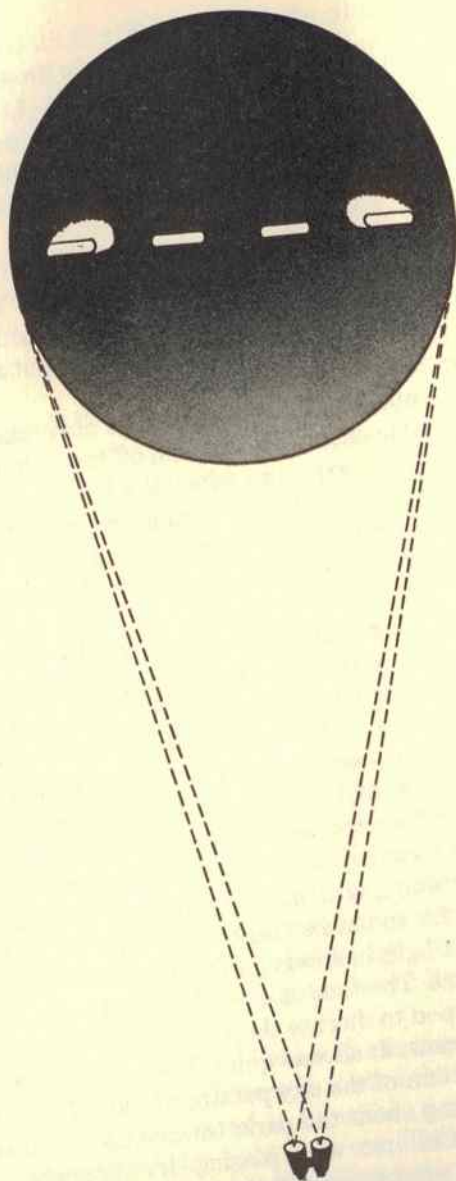


Fig. 8-3 The four lights on the rear of the craft that passed over the runway were, left to right, white, red, red, white

long and narrow light seemed to be attached or molded to the back of a huge wing, although I couldn't make out any form in the darkness (Fig. 8.3).

I was amazed at the size of the configuration, by its apparent low altitude, and by the swift, silent way it moved through the night. And, of course, I had never seen lights attached in such way to any type of flying craft. Immediately, I raised my binoculars to my eyes and looked at the white light on the left. It was bright but not unusually so. Light from it reflected from what appeared to be a metal, like aluminum. The same was true when I looked at the white light on the other side. Quickly, I scanned from the white light to the first red light. The light was emanating from what appeared to be red glass—similar to that used in the taillights of cars. Through binoculars, I could clearly see a raised or ribbed structure, ostensibly for reinforcing the glass (Fig. 8.4). Surely, I thought, this looked too real to be something from across the galaxy.

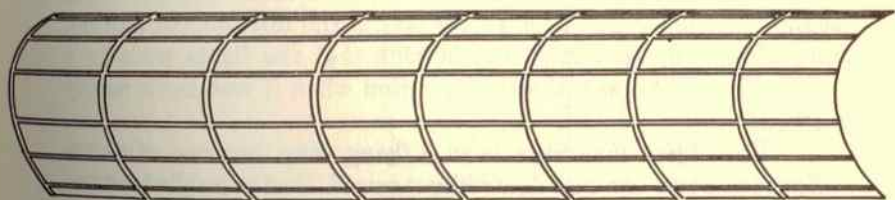


Fig. 8-4 The lines represent the raised or ribbed structure in the red glass that was attached to the rear of a large, silent craft, Fig. 8-3

We couldn't photograph the configuration because our equipment was back near the car, about 150 feet away, and the craft was moving too fast for us to reach our equipment in time. Within seconds, the lights were out of sight. John repeated his now-familiar refrain: "Boy, it was really honkin' on!"

Immediately, I went to the operations building and telephoned the FAA Flight Service Station (FSS) at Cape Girardeau to obtain the cloud ceiling. The figure quoted to me was 10,000 feet. This figure, along with my examination of the craft through binoculars, provided data for a calculation of the spacing between the outside white lights, or the width of that part of the craft I could see.

In my opinion, the craft was about 2,500 feet in altitude, yet the city lights did not illuminate it. Certainly, it was no higher than 10,000 feet, the ceiling quoted at the FSS in Cape. When I raised the binoculars to my eyes, I could see no more than one third the width of the configuration, because two adjacent lights did not fit into the

binocular field of seven degrees. So as not to overstate the case, I assume that I could see half the row of four lights; i.e., that the row actually subtended fourteen degrees rather than twenty-one degrees. From this figure, the width of the lights can be calculated for assumed altitudes up to 10,000 feet, the height of the overcast.

The calculations are summarized in Fig. 8.5. As indicated in the drawing, a craft flying just under the cloud cover would have been nearly a half-mile across; at 2,500 feet, it would have been more than 600 feet across. At 1,500 feet, the width would have been 368 feet, more than the length of a football field. The wingspan of the B-52, the largest bomber in the U.S. Air Force, is a mere 185 feet by comparison, although the wingspan of the C-5A Galaxy, a heavy transport aircraft, is 228 feet.²

During this sighting, I noted one other strange fact. For the entire time they were in view, none of the four lights was masked by a fuselage, nor was there any visual clue that a fuselage or such appendage existed. To me, the row of lights made a slight angle (slightly swept wing), whose vertex was in the direction of motion. John disagreed; he was of the opinion that the lights were in a straight line, but I saw the configuration when it was more nearly overhead.

The object may have been a flying wing, but one of extraordinary size and one that flew without sound. During public lectures I have given about UFOs, a few scientists have suggested that the craft may have been very low. My response has been: "Why didn't we hear sound; at least the rush of air over an aerodynamic surface?" If the craft were a large jet in a glide, with engines idling, we would have heard the engines. Was it a coincidence that this craft flew the return course of the airplane with the red light on the right wing sighted earlier, in violation of FAA regulations? But also disobeying regulations was the "flying wing," as was the ball of light seen east of the airport!

As discussed earlier, this sighting of the "flying wing" was classified as an example of a Class A (incredible) sighting. Why? Because there was a low, heavy overcast, which places an upper limit on the altitude of the object; because there was a reasonable estimate of the angular width of the light configuration; because there was no sound. And because there were three witnesses for verification, this must be called an incredible sighting. No other classification is reasonable. In this case, the observer need not have a Ph.D. degree in physics to know that a very strange craft had passed overhead.

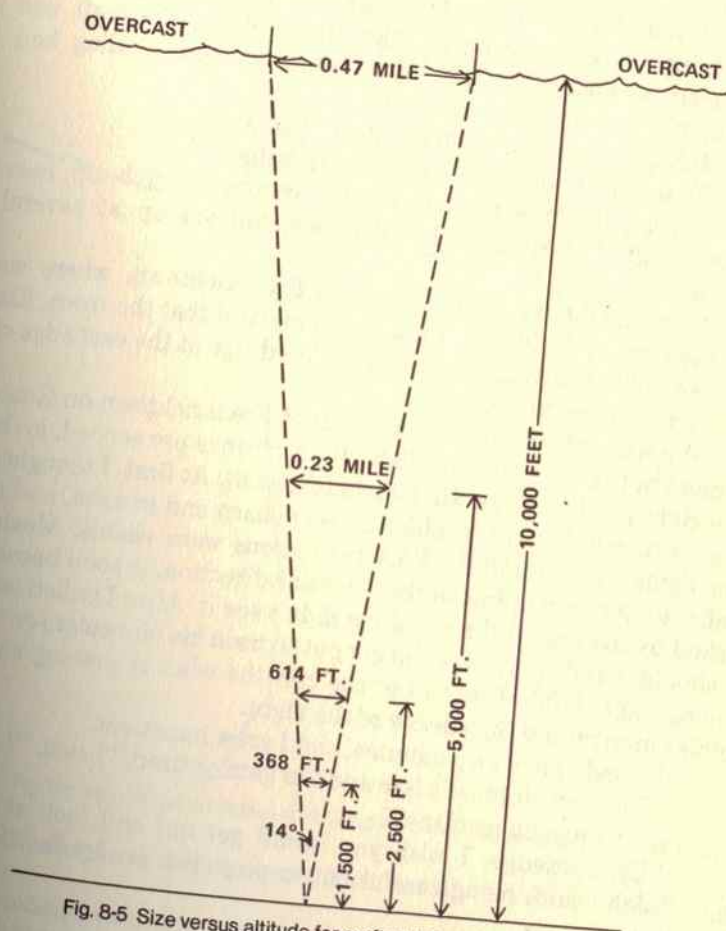


Fig. 8-5 Size versus altitude for craft with four lights in the rear

It was getting late, and we figured that we wouldn't see any more UFOs for the evening. John and I loaded our equipment in the Ambassador and began our journey back to Cape. As we rode along, I could tell that John was keyed up, as was I. The full impact of the four sightings was beginning to take effect. When the craft had passed over without a whisper of a sound, an eerie feeling had surfaced, one that we could not shake.

"John, it's been quite an evening," I said.

"Yeah," he responded, "it's hard to believe."

"We'll get some boys from the astronomy club up here tomorrow night," I suggested. "Then we can set up at several locations."

At midnight we passed through Fredericktown, where we made the turn off Route 67 to Cape. I remarked that the town, like Piedmont, folded early in the evening. A road sign at the east edge of town read 52 miles to Cape.

We were about one half-mile out of Fredericktown on Route 72 when I noticed a xenon-like light, flashing once per second, in the upper right portion of my windshield (Fig. 8.6). At first, I thought it was an airplane, but the strobe was very sharp and intense, and no other lights as required by FAA regulations were visible. Moving parallel to our course but in the opposite direction, it soon became masked by the roof of the car. John didn't see it. After I pulled onto the shoulder and stopped, John got out to train his binoculars on the flashing light. While I waited in the car, the whiz of passing automobiles interrupted the silence of the night.

Seconds drew into minutes, and I grew impatient.

"Come on, John, it's late and I'm getting tired," I said. "Let's go home. It's just an airplane."

"Dr. Rutledge, I wish you would get out and look at this thing," John said, being careful not to prejudice me by describing the event.

Unknown to me, the light had turned south as I parked the car. A coincidence? As I watched through binoculars, a strange scene unfolded: the light was jumping back and forth across the entire binocular field. The sequence was a flash at the top, then the bottom, the top, and so forth. An eerie feeling increased. To make sure that the change in position was not caused by my involuntary movements, I laid the binoculars firmly on the roof of the car. The effect persisted: flash-top, flash-bottom, flash-top, flash-bottom. As my eyes adjusted to the darkness, electric power lines by the side of

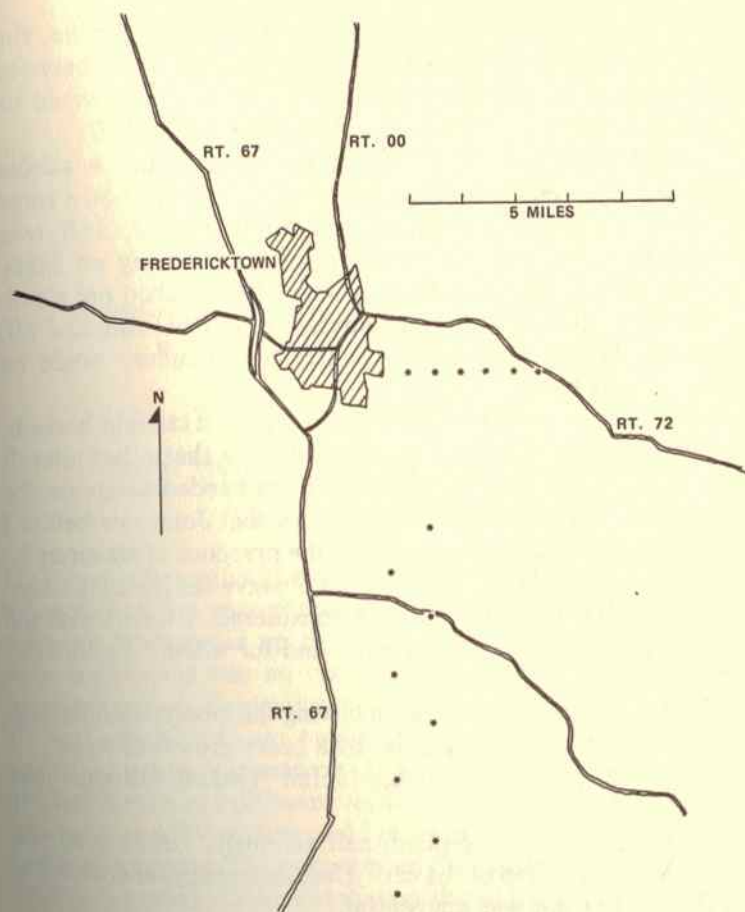


Fig. 8-6 Map of Fredericktown area; jumping xenon strobe light

the road became visible, assuring me that there was no binocular movement.

Suddenly, the strobe light changed pattern; it jumped sideways. Could this thing be flying a helical pattern? I wondered. More than three minutes after I first viewed it in binoculars, the pattern subsided rather abruptly, although the brightness of the light decreased rather uniformly throughout my observation. John, tired of holding the heavy 15 X 65 binoculars, had ceased to observe.

Again, my binocular observation allowed me to make an analysis of a Class A sighting.

Assuming that the light was jumping through an angle of six

degrees in my binocular field while at a distance of ten miles, the sideways jump distance is one mile! Because the time between flashes was about one second, the sideways jump speed would be 3,600 miles per hour. Was there an object really doing this?

I have been told by a Viet Nam veteran that a similar phenomenon was created by installing many large lights on a cargo aircraft. Two of these aircraft, separated by a mile or so, would fly over Viet Cong territory with one of the aircraft displaying no lights. Upon radio signal, the aircraft lights would be switched on; simultaneously, the lights of the other aircraft would be switched off, creating the illusion of a jumping light. The procedure would be reversed seconds later.

When I first saw the strobe light, it was on a straight horizontal path, going west. I had no reason to believe that other aircraft were present. Four aircraft would have been needed to create the pattern I observed. The slant-jump pattern that John saw before I got out of the car would not necessitate the presence of six aircraft.

This was not the last time I would observe the jumping xenon strobe light (JSLX). Other sightings considered, I doubt that the military would create such a charade—and for whom? Again, FAA regulations were violated.

We got into the car and began driving the lonely, winding path of Route 72, bordered on both sides by a heavy growth of trees.

"What else can happen tonight, John?" I asked, with a nervous laugh.

"I don't know," he replied, half seriously. "Something will probably set down on top of the car!" Despite our apprehension, the rest of the trip to Cape was uneventful.

The same evening, Jim Sage and his crew at Piedmont had a sighting that resulted in our first triangulation data. An imaginary baseline, twelve miles long, was established between the viewing stations on Pyle's Mountain and the fire tower on Mudlick Mountain (Fig. 8.7). At Pyle's Mountain, the azimuth and altitude angles were measured using a Questar telescope. Because of the lack of space in the little structure atop the 100-foot-high tower, another device, used to locate the position of forest fires, was substituted for the telescope.

By 6:30, Drake and Steve were set up on Pyle's Mountain, having leveled their telescope with a spherical bubble, and having set the azimuth circle to magnetic north. Steve's Yashica 35-mm camera was loaded with infrared-sensitive film.

Mike and Jim went to the fire tower, where they had strung

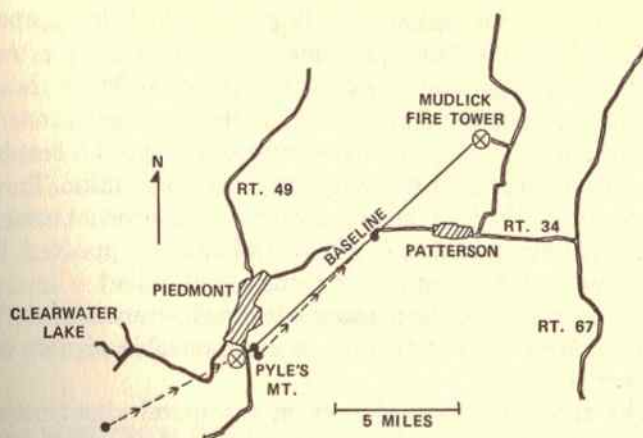


Fig. 8-7 Triangulation measurements made from two viewing stations on a 12-mile baseline

1,500 feet of fine antenna wire during the afternoon. The antenna was connected to the spectrum analyzer, which could display electromagnetic frequencies up to 1800 MHz.³ The spectrum analyzer's main component was an oscilloscope-screen display, similar to a television screen, displaying green lines instead of a picture. Unlike a TV set, which picks up only one electromagnetic frequency (TV station) at a time, a spectrum analyzer "looks" at many frequencies, displaying each as a different vertical green spike. For example, each area radio and TV station could provide a spike on the screen of the spectrum analyzer. The operator can control the range of frequencies displayed, perhaps looking at that portion of the radio broadcast band from 0.535 MHz to 1.605 MHz, say. Each spike would represent an AM radio station. The more powerful the signal from a station, the higher that individual spike. And the closer a station, the higher its spike as compared to an identical station farther away.

By 7:15, radio contact was established between radio unit 120 at the fire tower and radio unit 122 on Pyle's Mountain. Unit 121 was out of commission—and in Farmington. As the evening progressed, several lights were observed. Practice triangulation runs were made on passing aircraft.

At 9:39, the tower crew picked up an orange light southwest of Piedmont. The top of the fire tower is 713 feet higher than the viewing station on Pyle's Mountain, affording a better view. Triangulation measurements indicated that the light was six miles southwest of Pyle's Mountain at an altitude of 3,500 feet with

respect to the viewing station there (Fig. 8.7). The light approached Pyle's Mountain at 207 miles per hour, passing within a quarter mile to a location a half mile northeast of the mountain. There the silent ball of light went off, 310 feet higher than the viewing station.

Five minutes later, the light came on again, 300 feet higher than the viewing station and in a slightly different position. Traveling almost parallel to the baseline, the light moved northeast toward the fire tower, rising in altitude to 1,500 feet when it disappeared. Was it a coincidence that the light moved along our baseline?

Although radio static permeated the radio transmission during the sighting, Jim did not pick up any appreciable signals on the spectrum analyzer.

The two crews arrived back at the motel about midnight. Although weary, they huddled in the large outer bedroom to plot the orange light's path on a topographical map. A measure of success had come at last at Piedmont—and at Farmington.

During the evening in Farmington, we had seen three Class B sightings and two Class A sightings, in that order. More than likely, the first and third Class B sightings were of the same object, because the object was in the same approximate location when it reappeared. The two 1-minute exposures, Plates 9 and 10, show very little structure. But, most important, they show that the hovering light did not remain stationary during the exposures. The most obvious similarities between the two exposures are equal slopes and approximately equal lengths. An important difference is the density of each light pattern. In Plate 9, the density of the trail is uniform, while in Plate 10 the trail is less dense at the top. John did say that he terminated the exposure a little early because the light started to move, but no movement to the left is indicated in the exposure. When the object moved away, it went to the left. Apparently, the craft moved more rapidly while John was exposing the upper portion of the trail in Plate 10. Whether this occurred at the beginning or the end of the exposure cannot be determined.

After the disappearance of the object over a ridge to the northeast, John and I estimated that the distance to the light when hovering was five miles—an estimate that was to dictate the location of one of three viewing stations the next night. Because the light from the hovering object reflected from the cloud cover, we had a visual clue in making our estimate of distance. Months later, when I found the time to make a calculation of distance, our estimate of five miles agreed well with the calculated value.

The calculation itself depends on an estimate of the vertical

angle (angle of elevation) of the barrel of the 800-mm lens while the object was being photographed. John and I believe that an angle of 20° is our best estimate. Using this estimate and the value of 10,000 feet (the height of the cloud cover given by the FSS in Cape) the distance to the light was calculated to be 5.2 miles.

Because the barrel elevation angle is only an estimate, the calculation of the horizontal distance to the light is made for two other angles, 15° and 25° (Table II). Additional calculations of horizontal distance for the three angles are made, assuming a ceiling of 6,500 feet, the arithmetic average of John's estimate of 6,000 to 7,000 feet, made before dark at the Farmington airport.

TABLE II HORIZONTAL DISTANCE TO HOVERING LIGHT

Elevation of Lens Barrel (degrees)	6,500 feet Distance (miles)	10,000 feet Distance (miles)
15	4.6	7.1
20	3.4	5.2
25	2.6	4.1

The values of horizontal distance in Table II show that the object hovered relatively close to the airport—intentionally, it would seem. But why? Was it a coincidence that the light went out when the airplane approached from the west? Are helicopter pilots supposed to turn their lights off when a small private aircraft approaches? On the contrary, it would seem that the helicopter pilot would have kept all lights showing so that the pilot of the aircraft would have been aware of the presence of the other vehicle. And was it a coincidence that the object began to move during John's second exposure?

Before leaving the mechanics of the sighting, the speed of departure will be calculated with the data of Plate 11—a 9-second exposure of the object as it departed, using the 800-mm lens camera system. Although John masked the lens for 3 seconds, the entire trail length is 25 mm. The angular rate of motion of the light is 0.20° per second. Knowing the angular rate, the speed of the moving light can be calculated, if the distance to the sighting is estimated. In Table III, the calculated speed of the light is listed for assumed distances of 2.5, 5.0, and 7.5 miles. The speed refers to the movement of the light from the hovering position to its disappearance over the ridge

to the northeast. The speeds in Table III are not beyond the range of helicopters.

TABLE III SPEED OF DEPARTURE OF THE LIGHT

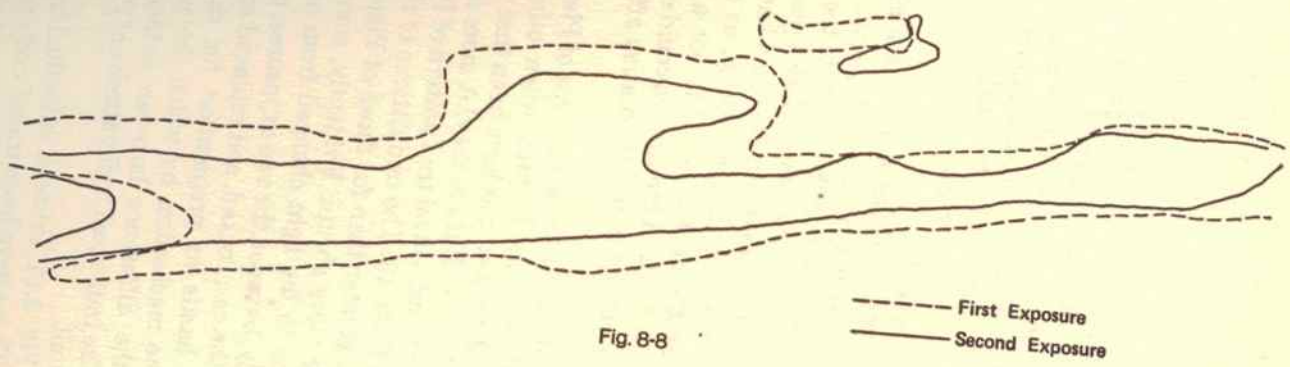
Distance (miles)	Speed (miles per hour)
7.5	94
5.0	63
2.5	31

Before the film that John and I exposed at Farmington could be developed, more than two weeks had elapsed. Late one evening in the darkroom at the University, just after John had developed the negatives, he turned on the darkroom lights, and we examined the film. All of his exposures were what we expected: trails, as in Plate 11. But when we examined the two consecutive frames representing my two exposures at Farmington (Plates 12 and 13), we were stunned. The patterns were weird, entirely unexpected, not normal like John's.

Why did the patterns differ so much? One possible explanation is that I was using a faster system, the 50-mm lens at $f/1.4$, while John was using the 800-mm lens at $f/8$. On the surface, my system was about 32 times "faster," or more sensitive, than his—noting that both cameras had the same type of film in them, developed under the same conditions. Later, when I realized that the light was moving so that its image moved across the film, I reconsidered the speed of the two systems and found that my system was really only twice as fast as John's. See Appendix.

Faster system or not, a search for the origin of the intricate patterns on film had to be made. Clues lie in the photographs and knowledge of existing conditions at the time of the two exposures.

Immediately apparent is the similarity of the general patterns of Plates 12 and 13. If the two patterns are superimposed, the similarities shown are a bulge in the center of each exposure, and a separation of the pattern near the left side of each exposure (Fig. 8.8). The pattern outline of Plate 13 is larger than that of Plate 12. The difference in size is contrary to what is anticipated, because during the second exposure, the light was farther away. Perhaps the similarity in the two patterns is a coincidence, but that seems unlikely.



Obviously, the slopes of both general patterns are downward from right to left, giving the sense of the light's motion. To compare the slopes of Plates 12 and 13, a "best" line is drawn lengthwise through the estimated middle of each pattern. Fig. 8.9 shows the slope of the general pattern of Plate 12. For a short distance on the plate, the initial slope is 6.5° , changing to 9.0° , and finally reverting to 1.5° . Fig. 8.10 shows the slope of the general pattern of Plate 13. For a short distance, the initial slope is a large 18.5° , changing to 9.5° . The slope of the general pattern should be determined by the slopes of the individual trails that make up the general pattern. Because the light was farther away for the exposure of Plate 13, the greater slope is expected.

For both exposures, the slope of the main pattern changes. For Plate 12, the change of slope is 7.5° , which differs little from the 9.0° change for Plate 13. But the points in the two plates where the slopes change are not in the same relative positions. The change in slope by the amount of these angles *could* have been caused by the rotation of the camera counterclockwise, as one looks through the camera. Because the roof of a car is not a solid base, increased pressure on the left side of the camera could cause counterclockwise rotation, producing the opposite rotation effect observed in Plates 12 and 13.

Obviously, the general patterns of Plates 12 and 13 are made up of individual trails. In fact, when others have examined my photographs, their reactions have been that the trails were produced by camera vibration. But are they? A more in-depth look is in order.

First, the individual trail pattern of Plate 12 differs markedly from that of Plate 13. The undulations of the individual patterns of Plate 12 are greater than for those of Plate 13. But the changes in Plate 13 are more abrupt. Evidently, some condition besides time and distance to the light changed from one exposure to the next. Procedurally, between the two exposures, the camera was lifted from the roof of the car, cocked, and replaced on the roof, and held firmly with both hands in preparation for the second exposure. Not knowing the mechanism by which the patterns were formed, the cause of the difference between individual trail patterns is not obvious. The individual trail patterns of Plate 13 will be examined in greater detail.

In Fig. 8.11, thirteen individual trails could be isolated from Plate 13. These have been traced and assigned a number in order of appearance, right to left, the sense of the motion of the light. The slopes and lengths of the individual trails are tabulated in Table IV.

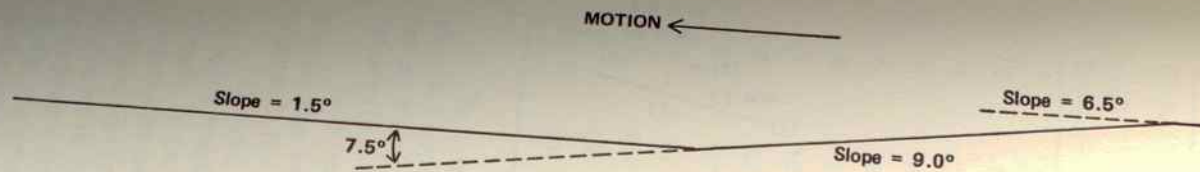


Fig. 8-9

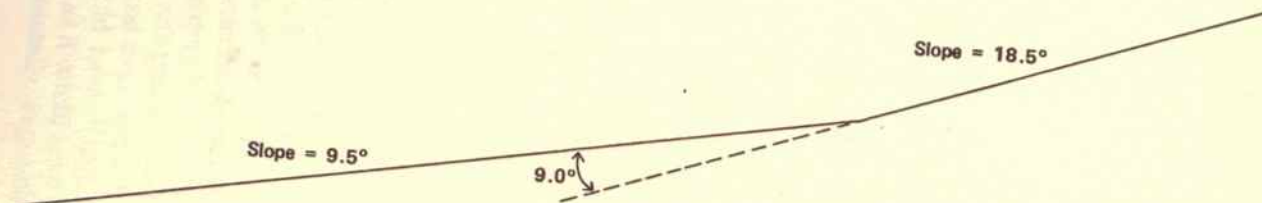


Fig. 8-10

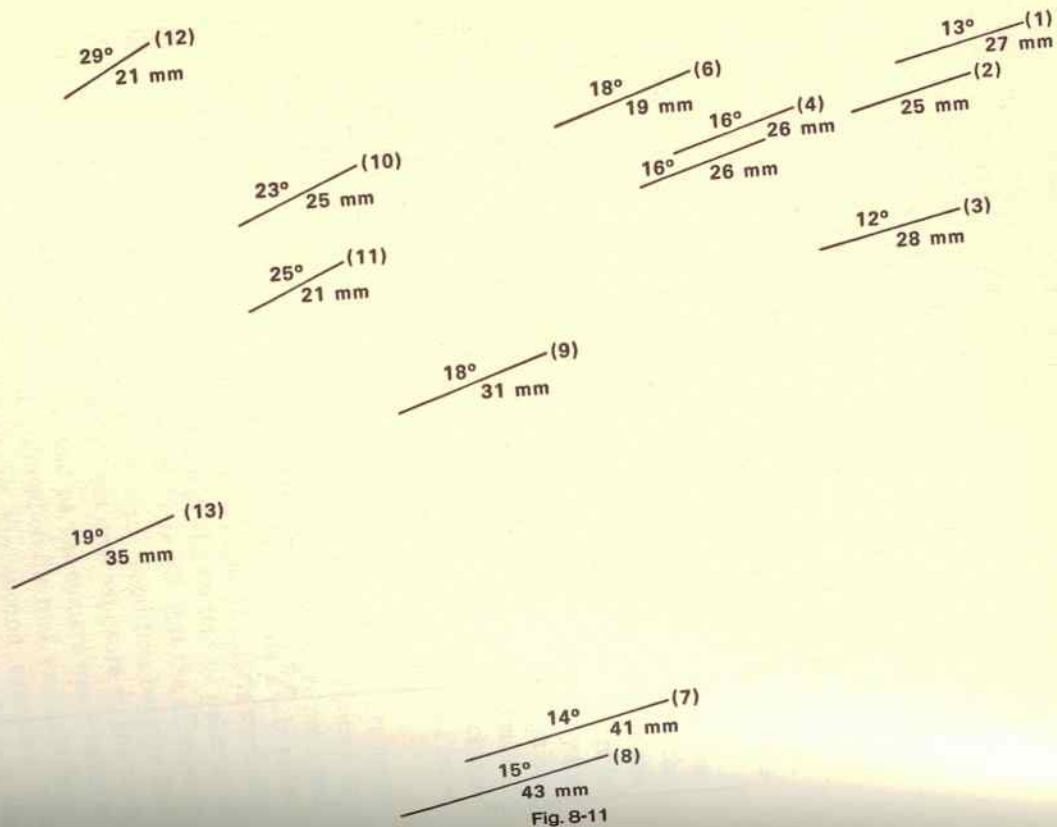


Fig. 8-11

TABLE IV INDIVIDUAL TRAILS: SLOPES AND LENGTHS (Plate 13)

Line Number	Slope	Left-to-right Length (mm)	Line Number	Slope	Top-to-bottom Length (mm)
1	13°	27	12	29°	21
2	13°	25	1	13°	27
3	12°	28	6	18°	19
4	16°	26	2	13°	25
5	16°	26	4	16°	26
6	18°	19	10	23°	25
7	14°	41	5	16°	26
8	15°	43	3	12°	28
9	18°	31	11	25°	21
10	23°	25	9	18°	31
11	25°	21	13	19°	35
12	29°	21	7	14°	41
13	19°	35	8	15°	43

In general, the slope increases from right to left, which is expected because of the large angular field of view of the 50-mm lens; but no trend is revealed. But from top to bottom, the trend is an increase in the length of the trails.

In Plate 12, the trails also lengthen from top to bottom. Surely, the trails at the bottom of Plates 12 and 13 are longer because in the sky, they were formed closer to our viewing station.

Second, the patterns of Plates 12 and 13 are repeated across the entire length of the frame, in each case a time exposure of 30–60 seconds. In fact, for all trails lying on a particular horizontal line across the frame, the trails are identical for a given plate. In Plate 14, the frame on the negative from which Plate 12 was printed, the frame was placed in the enlarger in the darkroom and overexposed. Had the exposure been too long, the pattern would have disappeared entirely; the print would have been black, just as it would have been had the darkroom lights been turned on accidentally, exposing the print.

The technique allowed us to look at the individual trails in that portion of the exposure where the density of trails is greatest—that is, the central portion of Plate 12, where they all run together. In

Plate 14, which was overexposed in printing, the individual trails remain and make up the entire general pattern of the exposure. Yet the individual trail patterns remain the same for any horizontal line across Plate 14. Compare the patterns of Plates 12 and 13 to those made from a moving vehicle on a busy street at night. A similarity will be noted; yet, they are not the same.⁴ That is, the patterns made by taking a time exposure with a camera in a moving vehicle at night of a city scene do not *repeat* across the photograph, as is the case for Plates 12 and 13. Of course, there is one major difference: the camera was moving with the vehicle, while at Farmington the camera was relatively still.

Most persons who have examined Plates 12 and 13 do not fully recognize the length of the trails in the sky. They were relatively long. The lengths of the trails can be compared with the length of the print, 246 mm, from which the lengths of the trails were measured. The length of a frame on the negative, 36 mm, was printed 246 mm long—a magnification in printing of about 6.8. A frame subtends an angle at the 50-mm lens of 39.6° . At a distance of five miles from the camera, this angle represents a distance of 3.6 miles, perpendicular to the camera lens.

Hence, by proportion, the length of the trail on the print can be converted to the length of the trail on the negative and, from there, the actual trail distance in the sky can be calculated. In Table V, the trail lengths in the sky are shown for both Plates 12 and 13, each for three assumed distances of the camera to the light. At five miles, a trail may be up to a half mile in length. In Table V, the length of the line of light pulses in the sky for Plate 12 are listed.

TABLE V LENGTHS OF INDIVIDUAL TRAILS IN THE SKY

(The actual trail lengths in the sky are greater than shown here, because the 50 - mm camera lens records only the projected path of a light on film.)

Distance to Object (mi)	Corresponding Dist. of 36 mm frame (mi)	Plate 12		Plate 13
		Trail Length (mi)	Length of Pulses (mi)	Trail Length (mi)
2.5	1.8	0.13	0.05	0.25
5.0	3.6	0.26	0.10	0.50
7.5	5.4	0.39	0.15	0.75

Another very strange aspect of both Plates 12 and 13 is the small light pulsations associated with each individual trail, which may be a significant clue to the cause of the light patterns. At the right end of the individual trails, Plate 12, is a sequence of light pulses—ten per line. The effect is easier to discern in Plate 15, a blowup of Plate 12. In Plate 13, lines of pulsation project *downwards*, not upwards as in Plate 12, from the ends of individual trails.

Plate 16 is a blowup of Plate 13. These pulsations suggest a light powered by alternating current, like that available from home wall sockets where the frequency is 60 Hz. To illustrate this effect, a camera was aimed simultaneously at the moon and at a mercury-vapor yard light with the camera set on "bulb" for a time exposure. At the instant the exposure was started, the camera was rotated quickly about a vertical axis. The image of the moon left a continuous trail on film, while the mercury-vapor light, powered by alternating current, yielded multiple images (Plate 17). If the frequency was the familiar 60 Hz and if both the negative and positive portions of each voltage cycle produced a light pulse (as is usually the case for so-called arc lamps), the time to form the line in Plate 15 is $1/24$ second (about 42 milliseconds). This information is useful in summarizing the discussion.

Because of the small AC-type pulses at the ends of the trails, one can hypothesize that the beacon light was somehow instrumental in producing the two patterns of Plates 12 and 13. The airport beacon light, of course, is powered by a source of AC electricity. If the moving object caused condensation of water vapor, then the film in the camera may have detected light from the beacon reflecting off water droplets. Light from the beacon was not picked up directly, because it was behind us. And light from the beacon striking the roof of the car in front of the camera and reflected into the camera would not have produced well-defined images, because the lens was set for infinity. The beacon makes a complete rotation in 20 seconds. Hence, an observer sees alternating white flashes and green flashes from this type of beacon at 10-second intervals. The angular height of the beam, according to FAA regulations, is from 1° to 3° , although the beam itself is rather broad. Assuming exposure times of 1 minute, approximately 6 flashes illuminated portions of the sky recorded in Plates 12 and 13.

Condensation of water vapor in the air depends on several factors, such as the amount of water vapor present (density), the temperature of the air, and the presence of condensation nuclei.⁵

For example, injecting carbon dioxide particles into the atmosphere will fail to bring rain unless enough water vapor is present to form on the carbon dioxide nuclei. The effect of temperature can be observed by placing ice and water in a shiny metal container. Water vapor in the air will condense on the metal surface at a temperature called the *dew point*, a temperature related to the relative humidity. On the night of May 24, 1973, the humidity was high. Perhaps condensation nuclei were provided by the exhaust products of a turbojet engine and stirred into vortices by the action of helicopter rotor blades.

Apparently, large helicopters carry electrostatic discharging systems that dump electric charges into the surrounding air.⁶ These ionic charges could serve as condensation nuclei for water vapor, but the air must be in a special supersaturated condition.⁷ (A supersaturated vapor is used in the Wilson cloud chamber, a device used to detect the tracks of charged atomic and subatomic particles.) In my opinion, the air was not supersaturated.

Another aspect of the individual trail patterns, almost as intriguing as the whole pattern itself, is the apparent helical shape (like a coiled spring) of the individual trails. The upper right individual trail in Plate 16 is an especially good example. It is not difficult to imagine that a small source of light corkscrewed through the sky. To see if this was the case for a particular trail, mathematics graduate student Jay Thomas scanned an individual trail with an image scanner. From the two-dimensional pattern on print, it was impossible for him to determine if it was a helix.

Reflections off the car's roof from the moving light source could possibly have produced multiple-trail images if the roof's surface was not mirror smooth, or if minute droplets of water vapor lay on the surface. (A mirror-smooth surface would have given only a reflected trail image in addition to the primary image formed by light entering the camera lens directly from the moving source.) This explanation seems the most likely, but serious objections can be raised.

Another explanation is that the multiple trail images were formed by light reflected from mist or dust purposely ejected from a helicopter. Since the moving light was seen to hover, it could have been attached to a helicopter.

Ironically, at the time the sighting was in progress, I felt that John, using the 800-mm lens camera system, would obtain exposures of greater detail than I could with the 50-mm lens camera system. If I hadn't made any exposures with the latter system, the

mystery of Plates 12 and 13 would never have been. One of the basic tenets I have learned from personal experiences in the field: never take anything for granted. This was never better exemplified than during the following Terribly Strange Night at Farmington.

NOTES

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A SECOND TERRIBLY STRANGE NIGHT

Day Five: Friday, May 25, 1973

Late Friday afternoon, John and I returned to Farmington, full of expectancy and with ample help. With us were several senior members of the Southeast Missouri Astronomy Club: Bill Nanna, Kenneth Aldrich, and Bob Adams. Nanna was project engineer at the Charmin Manufacturing Company plant near the Mississippi River north of Cape Girardeau. Aldrich, a retired Navy chief petty officer, was a junior high school science teacher at Scott City, nine miles south of Cape. Ken had brought with him a ninth-grade student, Danny Freed. Senior members of the Astronomy Club invested many hours each year in youngsters who showed an interest in astronomy—a policy they still practice.

After the introductions, I learned that in World War II, Ken had served in the South Pacific as a hospital corpsman with the “island-hopping Marines,” as he put it. On several occasions he had observed UFOs from a destroyer at sea. After the war, he had participated in Admiral Byrd’s Antarctic expedition, Operation Deepfreeze I (1955–57), wintering at Little America V, a base for the explorers.

At the Farmington airport, I instructed Bob to set up two field teams, one at each end of the runway. John and I would locate a few

miles east of the airport, in case the orange light appeared in the same position as the night before.

About 2.5 miles east of the airport we found a farm with no yard light. It was an ideal situation for photographing UFOs at night because—as we have discussed—when light from bright mercury-vapor lights enters a camera during a time exposure, curious patterns such as lens flares and halos can appear on the negative. When we explained our purpose to the owner of the farm, Fred Billedo, he described a sighting of the previous fall: a light had approached a distant tree to the east, stopped, hovered awhile, and left. He and his wife described several other perplexing sightings as well.

Billedo opened two gates, allowing us access to a verdant pasture, waist high in growth. I stopped the car near a patch of sparse growth in the center of the field. As soon as I got out of the car, I made a binocular scan of the sky. After all, it was only about 6:30—a long time until dark. There would be ample time to set up the equipment.

To my surprise, through the binoculars I saw a small ball of off-color white light to the east, traveling north at very low altitude. I had seen similar ones at Brushy Creek. Quickly I snatched the Questar telescope from the car, removed it from its case, placed it on the hood of the car, adjusted it for 80X, and looked for more white balls of light.

Sure enough, one drifted across my narrow field of view, taking about three seconds. According to Questar specifications, the field of view for the eyepiece I was using (40–80X) is 0.92° . Another light soon followed. There was little we could do to record these sightings, but they presaged another exciting night.

We hurriedly completed our setup and began our binocular scans. By this time, the lights to the east were gone. Very strange . . . and in daylight too! Because the lights had been so low, I wondered if persons living in the vicinity had seen them.

Before 7:00, while I was scanning the sky high to the southwest at an angle of about 45° , my attention became riveted to a spot in the sky where a series of xenon-type lights flashed at random. This most unlikely display lasted no more than four seconds. The lights appeared to be several miles away, and I was puzzled because they did not appear to be attached to anything. The display reminded me of aerial torpedo displays on the Fourth of July: a series of localized light flashes before explosions are heard—except in this case, there was no sound. This was not to be the last time I would observe this

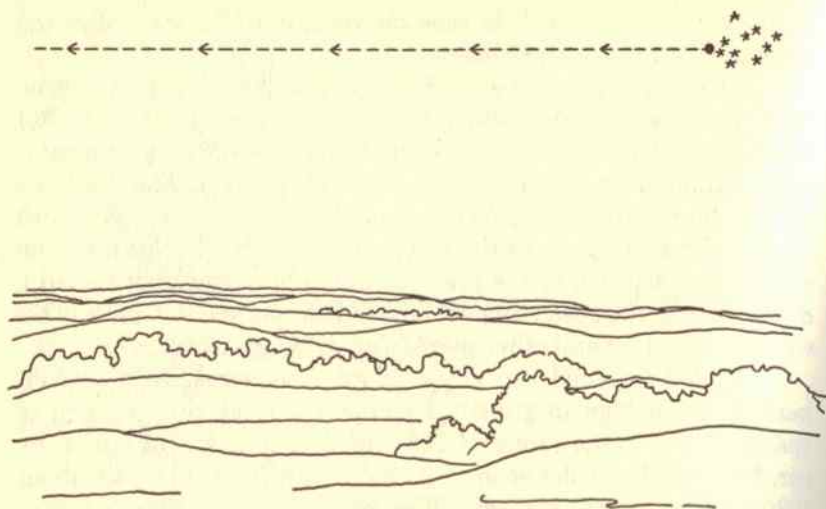


Fig. 9-1

phenomenon, which I have labeled “the random flashbulb effect” or RFEX, where X stands for xenon¹ (Fig. 9.1).

As soon as the RFEX terminated, an off-color white light came on in the midst of the area of disturbance and began to move eastward. Through binoculars, the light had no structure—it was just a small ball of light, apparently unattached to a material object. During a ten-minute period, the light progressed on a horizontal path to the east.

Finally, I terminated my attention on the moving light. A scan of the area where it originated yielded nothing unusual. During the entire episode, John could not locate the moving light, either with his naked eyes or through binoculars, because the light did not contrast well with the blue sky. I pointed at it several times, but did not remove the binoculars from my eyes for fear of losing sight of it.

Either the moving light was just that—a light unattached to a solid structure—or else the light was so far away that the solid structure couldn’t be made out, even through binoculars.² The analysis in this case is similar to that of the fifth and last sighting from Pyle’s Mountain on our first night in Piedmont. In this case, however, the objective was to determine the smallest vehicular size (length) that could be determined (resolved) at a given distance from the viewing station.

To make the calculation, I estimated the distance to the light as ten miles and used the magnification of the binoculars (10X). As was the case for the sighting on April 6, an eye resolution of 5 feet of

angle was assumed. Calculations show that a fuselage of 8 feet or more in length could have been resolved; at 20 miles, the fuselage length required would have been 16 feet or more.

The moving light could not have been a satellite, for several reasons. First, the light just appeared, "came on." Second, the light took ten minutes to travel less than the horizon-to-horizon distance. Hence, had it been a satellite, its altitude would have been far greater than the 180-mile minimum, and satellites at that altitude pass over in about two minutes. In my opinion, the light was not above the atmosphere, but could have been as high as 50,000 feet, because it did not reach the horizon within the ten minutes that I observed it. On the other hand, the light may have been traveling slower at, say, 10,000 feet.

Could the light have been an airplane, helicopter, or craft? Possibly. But during the ten minutes I watched it through binoculars, the light looked the same from various angles. It was not directional, nor did it become masked by any portion of a craft such as a fuselage or a wing. The light did not appear to be sunlight reflecting from a metal surface, either; the brightness was steady, diminishing uniformly as it receded to the east. Add to this that more than a half-dozen xenon-type lights flashed prior to the appearance of the white light.

About 7:30, through 15 X 65 binoculars, John saw an orange light, apparently beyond the airport to the west, traveling south. I verified his sighting. Next, he observed the light through the 800-mm lens (16X), using a Praktica 35-mm camera with 6X magnifying glass over the ground-glass viewing screen, for a total magnifying power of 96X.

"Dr. Rutledge, the light appears to have a fuselage structure behind it," John said, as he prepared to make an exposure. "It's going behind a hill. I'll snap one so that some terrain will appear in the picture." Then, moments later, he added, "It just faded out! I didn't get a picture at all!"

Later in the evening, on returning to the airport, we learned that both field teams had seen the light. They had thought the light was an airplane until Ron Short arrived at Ken's location at the south end of the runway and said, "That's it! That's the light!" Ken radioed Bob and Bill to the north of the change in the light's status. All watched it through binoculars. When southwest of the airport, the light disappeared. Ken and Bill told me the light "faded out," as John had put it, in about one second. On the contrary, Bob said, "It didn't fade out, it just went out."

At our viewing station 2.3 miles east of the airport, John and I

observed a very high-flying white light, traveling WSW to ENE, which faded out in the shadow of the earth, as satellites do. The field teams at the airport confirmed our assessment, as did the two field teams at Piedmont when we saw them later in the week.

As darkness approached, we watched the stars come out. To the east I noticed three stars in a vertical straight line. I did not know the names of the stars, but the presence of the straight line bothered me. I decided to check through binoculars. Although the two upper stars did not appear unusual, the bottom star "jiggled" when I looked at it. Immediately, I placed my Pentax camera on the car roof. Because of the ambient light remaining at dusk, I limited the exposure to fifteen seconds.

At the instant I began the exposure, the pseudostar began to move left, to the north (Plate 18). Although camera movement is apparent—as can be seen from the fuzziness of the treetops to the lower left—the path of the pseudostar is unmistakable.

After termination of the exposure, the pseudostar was gone. The other two stars in the original line followed the normal course of stars during the evening, traveling at the sidereal rate of 15° per hour.

Soon after dark, a low-flying object we thought to be an airplane approached from the east at an estimated altitude of 2,000 feet. We could hear an engine sound. Passing to the north of our position, it seemed no more than 2,500 feet away. John and I saw three red lights in the form of a large triangle (Fig. 9.2). In addition, a sizeable blue-green glow seemed to fly unattached off the right side of the triangle.

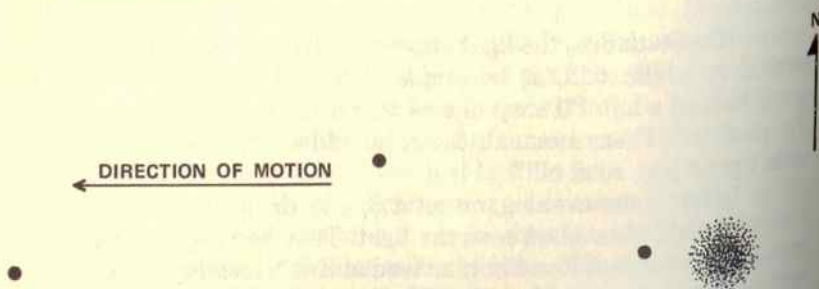


Fig. 9-2

John saw it differently. He saw two blue-green lights on the right side, not one light as I did, apparently attached to the main

body by a long, invisible wire. John said that the lights seemed to be following the triangle, that they seemed to be waving in the breeze, like the whip antenna on a car. Frankly, I don't know how John could have perceived two blue-green lights, but I did get the impression that the blue-green light was not part of the triangle structure. To me, the eerie light seemed to be escorting the triangle of red lights.

As it passed to the north of us, I said, "John, that engine sounds like a Maytag washing machine motor. It definitely isn't powerful enough to fly an airplane that size." John agreed with my assessment.

John attempted to photograph the craft, but because it was so close, it crossed the 3° field of view of the 800-mm lens too quickly. I should have photographed it with the 35-mm lens camera system, but then, I thought it was an aircraft—after all, there was an engine sound. The same type of craft with engine sound had been reported to me by Mike Toney. Seeing it fly over Piedmont, he had assumed that it was an Air Force plane.

Perhaps the strangest aspect of all is that team members at the airport never saw or heard the craft! While I watched, John was trying to photograph the triangle as it flew toward the airport. If the triangle was flying as slowly as 60 miles per hour, it would have reached the airport in 2.3 minutes. At 120 miles per hour, the time would have been about one minute. We saw the triangle apparently fly over the airport to the west; I even mentioned it to John. But they didn't detect it. Because there were several experienced observers at the airport, I find it difficult to accept that they didn't see or hear it.

In addition to the triangle's relatively large size, apparently underpowered engine, weird blue-green oversized light, and the result of subsequent experiences in the past seven years, I now suspect that the craft may have been transparent or without material structure. Certainly, no *solid* structure was seen. More important, the blue-green light was never masked by an opaque fuselage. (For that matter, the green navigation light on the right wing of an aircraft is not visible from the left side of the aircraft.)

Because of the engine sound, I didn't even label this a UFO sighting at the time; now I call it Class A. During the next few years, I received several reports of triangular-shaped objects seen in southeastern Missouri. One pre-1973 sighting involved Doris Ressel of Oran and her three children. At dusk, they left her sister's house near Kelso, traveling south on Route 61. In the distance was a "strange, unusual, stationary light, too low to be a star and too high to be a farm light." As they approached, the children became

curious. Mrs. Ressel pulled onto the shoulder, stopping almost under a triangular-shaped craft—with a large hole completely through its center. The children rolled down the windows to listen for sound, although the car engine was running. Hearing no sound, they became frightened. One child screamed, "Let's get out of here!" Before Mrs. Ressel could react, the object "shot" out of sight to the northeast.

The triangle was the last sighting of the evening for John and me. At 11:15, Billedo lowered the fence to expedite our departure. We had a short rendezvous at the airport where we compared experiences.

The other two field teams described a sighting John and I had missed. An orange light had approached the airport from the east, on a path that would take it north of the airport. The field teams accepted it as an aircraft, especially after it began a left turn as if to approach the runway to land. But then it just disappeared from view. All observers in the two field teams believed that for an aircraft that close, they should have heard an engine sound. Also, they reported that no anticollision light, as required by FAA regulations, was visible.

Truly, it had been a second terribly strange night at Farmington. We were eager to come back the next night.

Meanwhile, the same evening in Piedmont, Jim and Mike went to the fire tower on Mudlick Mountain to set up a viewing station. To their chagrin, vandals had destroyed the antenna they had so laboriously strung between the tower and trees the day before. Even worse, the wire had been stolen, and immediate replacement was impossible. Instead, Jim decided to bring the spectrum analyzer to Pyle's Mountain, where an antenna could be improvised. Hence, Drake would work with Mike at the fire tower while Jim and Steve would set up at Pyle's Mountain.

Jim constructed a system of dipole antennas, each of which could be connected individually to the spectrum analyzer by means of a coaxial switch. Each antenna covered a particular range of frequencies from below the radio broadcast band (0.5 MHz to 1.5 MHz) to 1100 MHz. In addition, he constructed an array of stacked Yagi antennas that was very directional and responded well to frequencies in the range of 140 MHz to 200 MHz. He had received reports of electromagnetic interference in this frequency range. The Questar telescope was readied for triangulation measurements.

Radio Unit 122 was at Pyle's Mountain, while Unit 120 was at the fire tower, its antenna attached to the tower structure. A few of the transmissions are given here:

9:10 (122): *Satellite sighting with naked eye, heading northeast. Could not locate in telescope.*

(120): *We could not locate either.*

Failure of the crew in the fire tower to see the satellite is understandable; the roof of the cabin atop the tower blocked their view of a large portion of the sky overhead.

At 9:30, Wellington Lemmer of St. Louis and a friend joined Jim and Steve on Pyle's Mountain as spectators. Lemmer was very inquisitive about the scientific equipment.

9:37 (122): *We have a light in the west. Could very possibly be an airplane. It is not strobing at this time.*

(120): *That's our sighting! That's our sighting over there! Start the fifteen-second marks.*

The cause of the excitement was an amber light seventeen miles west of the tower. Bearings and angular altitudes were measured and transmitted over the radio every fifteen seconds—not an easy task. Transmissions were recorded on tape. Wristwatches had been synchronized with the WWV time signal broadcast by the National Bureau of Standards from Fort Collins, Colorado. At the time, the station broadcast extremely accurate time signals on frequencies of 2.5, 5.0, 10.0, 15.0, 20.0, and 25.0 MHz.

9:42 (122): *We still have it in sight. It's moving across the sky rather slowly. It is fairly bright, say a first-magnitude star. It is yellowish-orange in color.*

(120): *We have it in full view now.*

Successful triangulation data were taken, beginning at 9:43. Readings were taken when Drake called out "Mark!" over the radio. But the radio interference (static) was so intense that the reading at 9:44 could not be deciphered at Pyle's Mountain (Fig. 9.3).

After nine triangulation measurements, the light was lost from view at the tower. Later calculations showed that the light traveled south at a speed of 310 miles per hour and, after turning toward Pyle's Mountain, approached at 325 miles per hour, until it turned to the southwest.

Ten minutes later, Jim picked up a very strange signal on the screen of the oscilloscope. The frequency spikes were pulsating both

like those observed that night on Pyle's Mountain. Finally, he reported his findings to a former Electronics Countermeasures Warfare (ECM) officer in the U.S. Air Force. The written report from the anonymous ECM officer follows:

Your display appears to indicate wide-band panoramic jamming with sweep frequencies. Such a jamming technique could be herring-bone patterns to such an extent as to cover the video section of a television and create buzz in the audio section. It would make a drown sound on radio.

Jim elicited an independent response from another former ECM officer. The reports were almost identical.

I recalled that many of the local residents at Piedmont had complained about jamming of their TV sets in March when lights flew over. The jamming signals Jim measured, ranging from 39 to 190 MHz, were in the television range of frequencies. For example, Channel 2 begins at 54 MHz, and Channel 12 ends at 216 MHz. Other VHF channels fall within this range.

In my opinion, we cannot say unequivocally that the jamming signal did not arise from a military aircraft. Surely, the range of the electromagnetic jamming signal is greater than the distance from an observer to an aircraft he can barely make out in the sky. And from an unofficial source, I have been told that on rare occasions, Air Force personnel do use their equipment to jam the TV range of frequencies, or even the lower AM broadcast band, 0.5–1.5 MHz. One night of jamming data is not conclusive evidence of UFO interference, but there has to be some reason that commercial TV channels were jammed so often during March at Piedmont. Persons from outlying areas told me that when the picture and sound were scrambled, they could step out and see a white light passing overhead. Additional experiences with these lights suggest to me that the Air Force may not be responsible at all.

At 12:30, personnel at both viewing stations terminated their watches. Consequently, they missed some of the action. It was 1:14 when Lemmer knocked at the back door of the white frame house, with a story to tell:

After you fellows left the mountain, I scanned the sky with 10 X 50 binoculars. I noticed an orange star in Scorpio, except there is no orange star where this one was. It was moving east. Farther east, I saw a larger orange light sitting there about 10° above the horizon. It appeared to be about 5 to 10 miles away.

I continued to observe the objects for approximately fifteen minutes. The small object finally moved towards the larger object in wavering flight. I shot some infrared photos with my Exakta camera. Through binoculars, I could not make out much detail due to the brightness. As the smaller object got closer to the larger one, the smaller one became brighter. . . . When the smaller one got right under the larger one, they both just turned off, like turning off a light bulb.

I was amazed to see anything tonight. I had no a priori belief in UFOs. I had read newspaper articles about strange lights over Clearwater Lake, and I drove here to see for myself. I am familiar with fixed wing aircraft from my days with the 2nd Marine Air Wing. I can't explain what I saw.

A disappointment was to follow when Drake developed Lemmer's infrared exposures in the kitchen sink, finishing at 2:20 A.M. The negatives were useless, however; apparently because Lemmer had kept the unexposed film too long in a drawer at his home. The film had deteriorated with age; to extend its useful life, it should have been stored in a refrigerator. But everything considered, it had been a productive night in Piedmont—and in Farmington.

NOTES

1. Harley D. Rutledge, "Light Flashes in the Sky," letter to the editor, *Physics Today*, Vol. 27 (September 1974), p. 11.
"Lights in the Sky," *Physics Today*, Vol. 28 (October 1975), p. 9.
2. Op cit.

10

RETURN OF THE RANDOM FLASHBULB EFFECT

After our experiences on Thursday and Friday nights, we looked forward with great anticipation to two more weeks of full-time field work. Unfortunately, a natural disaster was about to intervene.

Day Six: Saturday, May 26, 1973

Late in the afternoon, under a sunny sky, we left Cape for Farmington in a three-car caravan. With us was Rick Kuntze, a SEMO student and experienced photographer who brought his 500-mm Vivitar lens and 35-mm camera.

As we arrived at the airport near Farmington, our anticipation slowly turned to despair. Lightning flashes in the west illuminated a huge cloudbank. Not again! I thought. Hadn't we had enough rain for one spring? Within fifteen minutes, wind and rain engulfed us, rocking our cars. An hour later, I decided that the rain would continue sporadically most of the night, and I told the crews to go home. Had I given the signal only ten minutes earlier, we would have driven into the heart of a tornado east of Fredericktown.

When we reached Cape Girardeau, the water was several feet deep on many streets. Because we couldn't reach John's house, John and Mike stayed at my home. The next morning we learned that

Cape had endured 9.5 inches of rain, seven of those inches falling between 11:00 P.M. and 2:00 A.M. Automobiles had been washed away and seven persons were drowned in southeast Missouri and southern Illinois. No wonder our families had been concerned for our safety.

Day Seven: Sunday, May 27, 1973

On Sunday, Jim Sage brought the portable electric generator from Piedmont. The Civil Defense unit needed it to power water pumps to empty hundreds of flooded basements. Not only had the rain driven us from the field, but now we couldn't operate the spectrum analyzer. I was crestfallen. Local records show that on March 10 the Mississippi River exceeded its flood stage of 32 feet, and remained above that level for 98 consecutive days. Almost all of Bob Adams's farm, rich bottomland, lay under water.

We didn't give up. Sunday afternoon, John, Mike, and I left Cape for Piedmont, arriving at Pyle's Mountain before dark, soon followed by Bob in his pickup.

Later in the evening, when we were on watch again, a reporter from a national tabloid arrived. Although he didn't "believe in UFOs"—a phrase I detest—he was looking for a story. He did not get one from us, but indicated that he would tour the countryside to interview persons who had seen UFOs. (Three days later he turned up again, saying that he had heard UFO reports similar to those he had obtained recently in Pennsylvania where a flap was in progress.)

We left Pyle's Mountain about 3:00 A.M. Our score: zero.

Day Eight: Monday, May 28, 1973

At his home in Jackson, Jim got up quite early, considering it was Memorial Day. After breakfast, he telephoned Greenville, Mississippi, to inquire about the radar unit, but got no answer. Rather than go back to Piedmont, he decided to go to Farmington for the evening, but this plan was thwarted, too: the Highway Patrol told him that rain was still falling in the Farmington area.

Memorial Day in Piedmont did not amount to much. Bob had left for Cape about 5:00 A.M. During the afternoon, John and I drove east of Piedmont on Route B, searching for a new viewing location. On our return drive, we noticed a driveway entrance leading uphill and drove up the steep incline. "Heck," John exclaimed, "it's a cemetery!" It lay atop a high ridge where the view was excellent, except to the west, where trees masked the view. Cemetery or not, we decided to try it. Certainly, we would have no spectators to bother us.

After our return to the motel, I struck up a conversation with Glenna Waltrip. Although very reluctant to discuss UFOs, she did consent to describe a sighting in August 1969. While she was standing in front of the motel, a large white light had passed "directly over the shoe factory" across the street at 7:00 P.M. on a clear evening. The light was very low and made no sound. "I thought at the time that if the light went out, there would be nothing there," she told me. Later in the summer, I would better understand her meaning.

After a dinner of cold cuts, John, Mike, and I went to the cemetery. By 8:40 we were ready. As we moved about, city lights reflecting from tombstones flashed brightly. The cemetery was still, and our log was brief:

9:15: It is getting dark. The overcast is heavy, but we feel a cool breeze. An airplane is passing to the west above the clouds. It sounds like an airplane.

9:50: Pretty cloudy. A few stars have peeked out. Nothing yet.

10:30: Still overcast. Nothing has happened.

12:50: I am taking a photograph of the star Antares as it passes across the field of view of the Questar. I am placing my hand in front of the telescope for one second out of every ten seconds. This will yield the angular velocity of the star.

1:00: We are giving up. What a way to spend Memorial Day, 1973!

Day Nine: Tuesday, May 29, 1973

After breakfast, John and I drove to Cape, returning to Piedmont in the afternoon. Rain again started to fall during our return trip. In the evening, John, Frank Horton, and I set up a vewing station at the cemetery while Jim, Drake, and Mike went to Pyle's Mountain, 1.6 miles to the south. With Horton's long Lincoln Continental parked on the cemetery drive behind the Ambassador, it looked as if a small funeral was in progress.

Thirty minutes later, large water droplets began falling. Soon, Horton was on his way back to Cape, rained out once more. The rest of us retreated to the motel for a long bull session.

Day Ten: Wednesday, May 30, 1973

Wednesday started poorly; one tire of the Ambassador was flat and had to be changed. After breakfast, John and I went to the radio station where one of the announcers was in a talkative mood. After describing mysterious bow waves he had seen on the surface of Clearwater Lake, he mentioned "an intersection of lights," a term

Hovis used frequently. The announcer went on to say that one light approached another "going thousands of miles per hour when it entered the other light." I was reminded of my sighting at Brushy Creek on April 13.

It was my morning to hear UFO stories. When I got back to the motel, I met a guest outside his room getting ready to leave. After salesman Stephen F. Estell learned of our purpose in Piedmont, he related a strange tale:

In the fall of 1957, I was driving my car along a flat highway in eastern Iowa near the Illinois border at dusk. The sky was nearly devoid of clouds. My mother and sister were passengers. My headlights and radio were on.

Suddenly, the headlights flickered and went out! Tremendous static saturated the radio. The engine sputtered and died as we coasted to the shoulder. Then, we heard this terrible roar overhead. We all had a mental picture of an airplane about to crash.

I stopped the car and got out. About 35 feet above us was this oblong or cigar-shaped object, going through all kinds of contortions, like a football bounding. The craft seemed to be in trouble, about to crash. Then, it regained its equilibrium. When I blinked my eyes, it was no bigger than a dime, but still shining brightly. After it left, the car and accessories were operative again.

His story is typical of many that appear in books about UFOs.

After lunch, Gary Myers from St. Louis arrived in his red Volkswagen to replace Steve Huffman, who had returned to Cape on Sunday. Gary was a student at the University of Missouri at St. Louis, majoring in astrophysics. He quickly became acquainted with other project members. Open minded on the topic of UFOs, he appeared capable and intelligent and would be an asset to our research effort. He had brought with him a Celestron 8 telescope that had a mirror eight inches in diameter, much larger than the 3.5-inch mirror of the Questar telescope. A larger mirror gathers more light and gives better resolution; therefore finer detail of a viewed object is theoretically possible, assuming that the quality of both mirrors is the same.

The Celestron telescope had a much more important advantage: the small finder scope, used to locate objects initially, was not perpendicular to the axis of the telescope barrel, as was the case for the Questar. The Questar is an excellent telescope for terrestrial and astronomical viewing and, in some respects, is superior to other

telescopes sold commercially. But it was not designed to track moving objects—a difficult task even with telescopes like the Celestron.

After consultation with Jim, I decided to set up a viewing station at Millers High Point south of Piedmont. Maude Jefferis had taken *Detroit News* reporter Bill Clark there one night in late March. I wanted to try the location.

The six of us loaded into the Ambassador to go to Millers High Point, traveling Route 34-49 past Pyle's Mountain, across the Black River. Eventually, we turned onto a side road and drove several miles. The road degenerated into a narrow path, and the terrain became increasingly rough. Trees clutched at us from both sides. We were in Mark Twain National Forest . . . and isolated.

When we found a clearing, everyone got out of the car to clear the brush. The view was open to the north and west, but was restricted to the south and east by trees. Smoke could be seen rising from Pyle's Mountain in the distance. John and I decided to set up there in the evening.

I had planned to nap upon our arrival back at the motel, but Drake persuaded me to go to the airport. He wanted to fly. Yes, the Cessna 150 was at Piedmont. I agreed if he would take me to Millers High Point to take some Polaroid exposures and to get a better feel for the compass directions. When we pulled to a stop at the airport, Drake told me, "Dr. Rutledge, I hear air leaking from a tire!"

Right he was. "My God, Drake! It can't be. Not two flats within twenty-four hours!" I said plaintively. "We don't have a spare!" It seemed we were having a run of bad luck. The weather—and now the tires. What else could go wrong? I thought. Nevertheless, we flew to Millers High Point, where I photographed the area and got a shot of Pyle's Mountain from the distance. After landing back at the airport, I telephoned Jim, who picked us up along with our useless, deflated spare tire.

After dinner, the crews departed early for their assigned viewing stations. At Millers High Point, John and I chopped down some small trees to improve our view. After setting up the 800-mm lens and the Questar telescope, we took bearings on Pyle's Mountain and other prominent features. In addition, we established radio contact with Unit 122 at Pyle's Mountain, where Jim and Gary were set up. Drake and Mike, Unit 120, were in the fire tower, about 22 miles from our position. We were radio Unit 121.

As usual, a huge cloudbank dominated the western sky. From

this bank, a long, narrow cloud protruded eastward for many miles. The rest of the sky was blue and cloudless. John and I scanned the sky with binoculars.

At 8:35 I saw it! Just above a small portion of the protruding cloud formation, I observed the familiar off-white light switch on in my field of view (Fig. 10.1). The hovering light pulsed once per second. No material object could be seen through 10X binoculars. Within six seconds, I observed the "random flashbulb effect" (RFEX) for the second time within a week. The flashes terminated in about four seconds, as they had at Farmington, but the white light continued to pulse. I raised the radio microphone and depressed the button to speak:

"122, this is 121. Over."

I was still watching the light through binoculars. At the instant I depressed the microphone button, causing a 37.1-MHz carrier signal to be emitted by the radio, the light in the distance went out.* Was this a coincidence? By the end of the week, a ham radio operator would report similar experiences to me. (The ham radio operators used much higher frequencies than the 37.1 MHz we were using.)

"This is 122," the other radio unit replied. "Go ahead."

"Jim," I said, "there was a blinking light over that cloudbank to the east. It just went out when I depressed the mike switch. Some other lights popped off around it. Is that cloud nearly overhead?"

"No," Jim replied, "it's about twenty miles north of us."

"That far!" I exclaimed. "It seems closer. That makes it about thirty miles north of us. It's north of the fire tower. O.K. We'll be in touch if anything else develops."

The crew in the fire tower confirmed that the cloud was north of them.

With darkness came a cacophony of sound from the nearby woods. Small animals rustled branches, crickets chirped, and whip-poorwills added their song to the orchestration. I recorded the sounds on tape. With darkness, we could see the fires on Pyle's Mountain, where people dumped trash, often at night. Perhaps this explained the affinity of flying objects for the mountain: the fires served them as a beacon.

At 9:57 all stations reported a possible sighting, but it was soon identified as a satellite. Various aircraft were spotted during

**This sighting, and the sighting of the RFEX the previous week at Farmington were reported in Physics Today (September 1974), p. 11.*

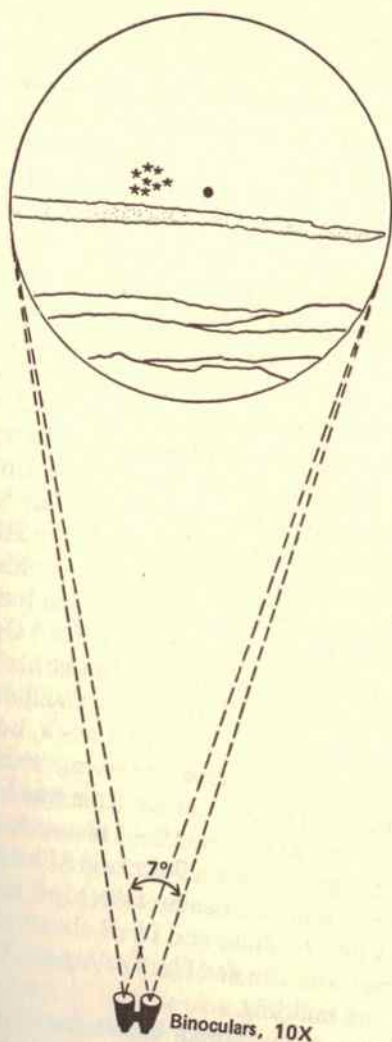


Fig. 10-1 From Miller's High Point, the random flashbulb effect (RFEX) and a pulsing light were observed over a narrow cloud about 30 miles away and extending many miles to the east. The phenomena were observed through 10X binoculars

the evening. After midnight, the crew in the fire tower generated momentary excitement. But it was only the great planet Jupiter rising in the east. Gary identified it through his Celestron telescope.

At 2:00 A.M., I took the microphone and radioed the crews to quit for the night. Everything was covered with dew; all of us were very tired. Ironically, all of the action had occurred *before* sundown. All those hours on watch after dark had produced nothing.

Day Eleven: Thursday, May 31, 1973

Thursday morning, Jim left for Cape John and I soon followed, leaving instructions for Gary and Mike to meet us at Farmington in the evening. Drake was to fly the Cessna 150 to Farmington.

In Cape, Jim telephoned Greenville and cancelled the radar set rental order, since the unit would be useless without an electrical power generator. I took the Ambassador to the University garage. Not only did it need a spare tire, but the muffler had been ruined during our forage deep into the woods at Millers High Point. Vince Seyer, the shop foreman, informed me that he couldn't repair the car by 5:00, which was our planned departure time but also the end of his work day. Instead, I was assigned a new Ford Galaxy.

With John driving, we picked up Jim at his home in Jackson at six o'clock, on our way to Farmington. While we rode along, I reflected that we had gotten data our first week, but that the second week had been different; we were observing transient phenomena and getting no measurements. Because little was happening at Piedmont, I considered terminating our field research there.

At the Farmington airport, John and Mike set up the 800-mm lens camera system and a Questar telescope east of the runway. Exactly one week before, John and I had observed a stationary light from this same location. Jim and Gary set up the Celestron telescope near the operations building.

Darkness came, but Drake didn't. I waited in the operations building in case Drake sent a radio message. At last, I heard his call. From his aircraft a few miles south of the airport, he was observing two amber balls of light near the ground below. I instructed him to approach the runway from the south, to land, and to taxi to the north end. I would be waiting there to get aboard. In order to minimize the time on the ground, I waited in the middle of the runway. Soon, I could see the lights of the approaching Cessna. Drake snapped on the landing light, made a landing that only skilled pilots can perform, saw me standing in the runway, taxied close, wheeled the plane around, and let me climb aboard. Within seconds, we were in the air.

Failing to find the amber lights that Drake had seen, we initiated a search. To the southeast a thunderstorm was in progress, while lightning also flashed the eastern sky. Although we saw two orange balls below us, we did not go down to investigate because we were on the edge of a storm.

About 20 minutes later, we were southwest of Farmington, flying west. Straight ahead was the constellation of Gemini, the Twins. At the time, I hardly knew one constellation from another, but for some reason, I became suspicious of a star in the lower right of the constellation. The light was at our altitude or slightly higher. Off-white, it was about the same brightness as Castor or Pollux, the constellation's main stars.

"Drake, I don't believe that star belongs there!" I shouted above the engine sound. "Let's fly straight at it and see what happens."

Suddenly the "star" brightened considerably, appearing to enlarge. At that instant, I suspected we were meeting a commercial jet airliner. But then the light decreased in brightness and apparent size, appearing to move directly away from us. But there was no lateral motion.

"Keep flying toward it!" I yelled. "Those things can fool you. Remember what happened to Kenny Pingel right here at Farmington."

For several minutes we continued on course. Suddenly the light brightened, which was soon followed by a lateral move to our left. In 10X binoculars, I could not make out any structure; just another ball of light. None of the lights required by FAA regulations could be discerned. Outdistancing our Cessna, it soon disappeared to the southwest.

Drake radioed the Air Traffic Control Center at Kansas City. Their radar had "painted" our Cessna 150, but had not painted the moving light. When I first noticed the pseudostar, Drake had radioed the operations building to inform Jim of our sighting. They had observed an orange light in the northwest sky, and Gary examined it through the Celestron telescope. Two red lights, a bright white light, a dim white light, and a green light were visible on the craft as it moved south.

In my opinion, they were not observing the same thing we were; theirs was an aircraft. Our light was not in the northwest sky. They should have observed variations in brightness just as we did. If we were observing an aircraft, it should have provided a radar return—unless the radar controller simply missed it.

After flying for another half-hour, we were low on gasoline. Therefore, we returned to the airport to join the ground observers—but not for long. The visibility was reduced by increasing fog, causing us to terminate our watch.

John rode back to Cape with Drake in the Cessna. When they approached Runway No. 02 from the north, they saw orange lights, one on each side of the airport, each less than a mile from it. John said that the lights appeared to be hovering at about 1,500 feet, but they did not investigate further.

Meanwhile, I asked Jim to drive home, because I was exhausted. He agreed. We loaded the equipment and left the Farmington airport. Mike and Gary had left for Piedmont on Route 67. Instead of returning to Cape by way of Fredericktown, Jim chose to take Route 32 to Ste. Genevieve, then I-55 to Cape. I promised to stay awake to provide conversation during the trip home.

When we reached the outskirts of Farmington, we came to an intersection of Route 32 with an outer loop highway. Jim never saw the stop sign. A speeding pickup truck was headed toward my side of the car from the right. "Look out!" I shouted. Jim stood on the brakes, but we were almost halfway through the intersection. Fortunately, the driver of the pickup swerved around us somehow.

Although Jim was shaken by the experience, I was very calm, too tired to care. In years past, Jim had served in military intelligence and had worked as a police officer. He wasn't one to get excited, but now he didn't regain his composure for several miles. I concluded that he, too, was nearly exhausted. Viewing late into the night and driving during the day was taking its toll.

After reaching I-55, we turned south toward Cape. A while later, we heard a roar that pounded the roof of the car. Calmly, I leaned over and switched on the radio to check for electromagnetic interference. Jim bent over the steering wheel so that he could peer above the car. When he slowed the car, the noise abated. Neither of us spoke.

As the car regained speed, the pounding noise returned. Now, I could identify the source—a large diesel-powered truck about 150 yards ahead. When the distance between the truck and car became some particular value, the sound occurred.

Throughout the field research, I had wondered if Jim accepted the existence of UFOs. He had been noncommittal. His reaction to the sound told me he did. In fact, I learned later that earlier in the evening, John saw it in the southwest sky; Jim had observed the RFEX in the northwest sky from the airport. John said:

It happened before Drake arrived . . . before sundown, very near some clouds to the south southwest. I would move my binoculars to the left or right, up or down, about four degrees, the angular field of the binoculars. After each move, I would see one or two lights flash, and I wouldn't see it any more in that area. I'd move the binoculars and see them in a different place. The observation lasted from one to two minutes.

Day Twelve: Friday, June 1, 1973

Friday morning I went to my office at the University to pick up a sound detector constructed by our electronics technician, Lynn Bates. The basic component was a sound collector made from one of those saucer-shaped metallic discs that children use to slide on snow. A metal rod was mounted on the central axis on the concave side of the sled. A microphone, attached to a rod, was positioned at the focal point of the collector, and the microphone cord was plugged into a tape recorder secured to the back of the collector. The resulting unit was light, self-contained, and portable.

On our drive back to Piedmont, John was exuberant over his first night flight from Farmington to Cape. He described the orange lights seen while landing as well as the RFEX he saw at Farmington.

After we got to Piedmont, Gary and Mike went to Pyle's Mountain, while John and I went to the cemetery to test our sound detector. I taped a barking dog, but the sensitivity was much less than needed. I had tried to borrow from KSD-TV a microphone pickup unit used at St. Louis Cardinal football games, but it was not available. (Several months later, we obtained a three-foot-diameter radar antenna as a sound collector, and connected the microphone to a General Radio 1551-C sound level meter as well as a tape recorder.)

Although overcast as usual, the breeze was warm for a change. At 8:45, I saw a red flash of light to the northeast. Later, John thought that he saw a light enter a cloud, but he did not count it as a sighting as I did the red flash. At 10:00, I made a pallet out of my raincoat, using my jacket for a pillow. John was to sleep the first hour, and I the second. At 10:10, I heard a jet above the overcast, passing to the west. While watching the sky, I became lost in thought, completely detached from my funereal surroundings. I reviewed the status of our field study: The cost to stay in Piedmont was \$100 per day, and our sightings were only transient, with no data. I decided to terminate our study at Piedmont on Sunday.

John startled me back to reality with a groan. I signalled the crew on Pyle's Mountain with a flashlight. A return flash assured me of their alertness. At 11:10, John took his turn on watch while I slept.

At midnight, he awakened me. I decided we had been on watch long enough, for I had a severe case of autokinesis, a physiological effect that made one star appear to be circling another no matter how long I looked.² We went to Pyle's Mountain to get Gary and Mike. Back at the motel, a message informed me that Jim, instead of coming to Piedmont, would go to St. Louis to confer with an expert in Electronic Countermeasures Warfare.

Day Thirteen: Saturday, June 2, 1973

Saturday, John and I got up to an overcast sky. After breakfast and the usual check at the radio station, I decided that on our last full day in Piedmont, we should interview persons who had seen UFOs. Although I was familiar with basketball coach Reggie Bone's story, I wanted a taped interview. After all, Reg was something of a celebrity now.

When the front door at his home was opened, I was expecting a rather tall man, typical of a basketball star both in high school and in college, not the diminutive 5'8" person standing before me. We seated ourselves around a table in the living room, which was tastefully decorated and dominated by a large fireplace, while Reggie discussed his now-famous UFO sighting in late February. He had told the story so often that it sounded almost rehearsed. But as he talked, I was drawn to him. He was very warm and personable; no wonder he was held in such high esteem.

After a long conversation, John and I reluctantly left Reggie's cozy fire and headed toward Clearwater Lake. Unbelievably, another heavy rainstorm engulfed us. I couldn't even see the road ahead, so we took refuge in a tavern. Many UFO tales assailed our ears before we left.

After crossing the dam, we located the home of a man who had seen objects fly low in the early days of the phenomenon. On several occasions, his yard light had gone out and his TV reception had been affected. In addition, he confirmed a report I had received from Richard Lee Toney of Piedmont that a loose formation of white lights had passed over Clearwater Lake on the night of May 15. Because of his noncommittal stance and refusal to let us tape his comments, John and I left. I wondered if he was the no-nonsense type who didn't want to get involved, or whether he had been deeply affected by what he had seen.

After a light lunch, we drove to Brushy Creek where we interviewed Mr. and Mrs. Clyde Wilson at their farm as well as Edith Boatwright, their neighbor. All had stories to tell.

By the time we got back to the motel, Gary Myers had left for

St. Louis. We would miss him. After dinner, Mike, John, and I took a circuitous route through Greenville to Williamsville, where we stopped at the home of Helen and Clifford Crites, whom I had interviewed the previous week. Next, we drove to the center of a nearby field to set up our equipment, noting the shoulder-high grass and ground soft from recent rains.

Then, while John and Mike remained on watch, Crites took me to the home of Floyd White. I could see that judging from the variety of antennas protruding from the roof of his white frame house, White had more than a passing interest in amateur radio. During our introduction in the yard, I sensed his self-confidence: he wasn't particularly impressed with my credentials as a university professor. He claimed some 70 UFO sightings, but before we began taping, he uttered a classic statement: "I don't give a damn whether you believe me or not!" A portion of his report follows:

Not more than 30 feet above my car was a red, white, and green object. The lights were flickering on and off. My wife stood right here and watched it. It looked like three windows in that thing. It was about 9:30 or 10:00. Before the sighting, I was talking on the radio, and it was really cutting up. When the CB is on, the radio will buzz just like the high lines. You go outside, and they will be up over your house. Several times it has done this. A woman across the river had the same thing happen to her radio.

I've seen them several times sitting there in the air. We saw three lights in one night. They were little at first. Mr. and Mrs. Alvin Deason were here for coffee. When they got ready to go, the lights were large and colored. The lights took off like they were shot out of a gun barrel. Sometimes they just sit there and flicker on and off. Three of them did this once, just like they were talking to one another. Another fellow saw them too. When he turned on his powerful CB radio, they just went straight up! Sometimes the lights go out when you turn the transmitter on, but one the other night didn't.

An excellent raconteur, White also described a vehicle that landed at night and another UFO, large as a car, that was shaped like a cake pan.

"I've seen twenty or thirty come out of the west," he said. "They make a circle around here and go back to Piedmont. They really go!"

That matched information given to me by the town marshal the week before. Since rain was imminent, I thanked White for his information and returned to the crew in the field.

Luminescent fireflies and relentless mosquitoes took advantage of the twilight period. The impending thunderstorm blocked our view of a beautiful sunset. Our trip was not a total loss, however, because John had observed the RFEX again. We decided to leave the field before we became mired in mud, and visited in the Crites home.

On the way back to Piedmont, hard rain pelted the car. Our sojourn to Piedmont was ending the way it had begun: rain, rain, rain. That we had any data at all was a miracle.

Day Fourteen: Sunday, June 3, 1973

Sunday morning, we packed as much equipment as possible into the Ford Galaxy and drove to the fire tower, where we carried a radio and car batteries down the steep, winding stairs. Atop the tower, I quizzed Mike about the sighting on the night of Friday, May 25. His description seemed compatible with the angles measured. To be sure, I marked the four major compass directions relative to the tower, taking color-slide exposures before descending the tower for the last time.

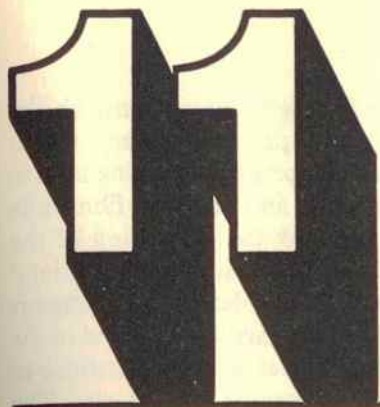
When we reached the intersection of Route 72 and I-55 between Jackson and Cape, we said goodbye to Mike, who would hitchhike to St. Louis. But our work wasn't complete. John and I made a second trip to Piedmont to secure the rest of our equipment. Jim made one trip for the same purpose.

Bob had told me that moving white lights were seen during Friday and Saturday nights. Both nights, one had been moving in the constellation Corvus and another in Gemini. At 9:00 P.M., John and I arrived at Adam's observatory, located on his farm. Sure enough, the pattern of the previous two nights repeated. Apparently, the UFOs had come to Cape Girardeau before we did. We agreed to continue the field investigation on Monday night.

The Piedmont phase of the field investigation was over.

NOTES

1. David M. Jacobs, *The UFO Controversy in America* (Bloomington, Ind.: Indiana University Press, 1975), p. 264.
 2. Condon Report, p. 565.
- M. Minnaert, *The Nature of Light and Color in the Open Air* (New York: Dover Publications, Inc., 1954), p. 142.
- Barry Schiff, *The Proficient Pilot* (Washington, D.C.: Aircraft Owners and Pilots Association, 1980), p. 63.



A MILITARY PRESENCE

Although we had planned to remain at Piedmont for three weeks, we stayed only two weeks because of the paucity of data during the second week—and because UFOs were then being reported in the vicinity of Cape Girardeau!

On Monday night, June 4, the summer phase of the investigation began in earnest—with the help of the Southeast Missouri Astronomy Club. Four of us were set up on Nash Road, two miles west of the Cape Girardeau airport. In the level floodplain of the Mississippi River, this location, which we were to use frequently over the next few years, provided an unrestricted view of the sky. Being on low ground, however, our camera and binocular lenses were susceptible to dew on summer nights and frost during winter viewing.

Bob operated a Questar telescope with 35-mm Beseler camera attached. Behind the telescope was a thin diffraction grating through which the light had to pass before entering the camera. The diffraction grating separated the light into the component colors of its spectrum. From the color spectrum of a light source, scientists can determine what materials constitute that light source. The color spectrum and the fingerprint are analogous: both provide clues. Our objective was to obtain the color spectrum of light from a UFO in order to determine the physical properties of the light we were observing.

John used the 800-mm lens camera system while Ken Aldrich had a 135-mm lens connected to his Pentax camera. But during an exposure, one cannot see through a single-lens reflex camera. A

mirror inside the camera used to deflect light coming through the objective lens to the viewfinder via a fixed prism (or mirror) pivots upward when the cable-release button is depressed, allowing light to pass straight through the shutter opening, and onto the film while the focal-plane shutter opening is open. At the conclusion of the exposure, the rotating mirror pivots back to its normal position.¹ Members of Project Identification used single-lens reflex cameras almost exclusively. So Ken had rigged binoculars to the barrel of the 135-mm camera lens and aligned them so that he could continue to view a magnified image of the UFO while making an exposure. The optic axis of the binoculars was aligned with that of the camera; that is, the center of each view coincided. Each night during setup, Ken diligently realigned the system.

All the cameras were loaded with GAF color film, ASA 500, except for my Pentax, which was loaded with Tri-X, and another camera that was loaded with infrared-sensitive film.

The sky had a look that we had come to expect in Piedmont: a cloudbank threatening in the west. Certainly the bottomland did not need additional moisture. Although dry now, deeply rutted Nash Road had been a quagmire, having been covered by floodwater for weeks throughout the spring. Bob had not yet planted soybeans, but the weeds were doing quite well.

Bob was an experienced observer with a good eye. At 9:55, he spotted a dim white light, similar to the others we had already observed during the weekend, in the southwestern constellation of Corvus. Possibly it was a satellite, because it disappeared in the east. At 10:05, Bob picked out another light passing through Corvus that faded out two minutes later to the east at a compass bearing of 160°. At 10:07 Bob picked out another light in the western constellation of Gemini. The westerly course of the light precluded its being a satellite, for it would have been in retrograde motion; that is, traveling opposite the easterly rotation of the earth. Because of the extra expenditure of rocket fuel needed to launch to the west, launches are usually made in a general easterly direction.

While the rest of us were engrossed in watching the light in Gemini, John remembered to check other areas of the sky—a lesson we had learned from experience. A shout interrupted our conversation. “A light is coming, Dr. Rutledge! A light is coming from Chaffee!” We had just checked that portion of the sky, but John was correct: The approaching amber light had already passed Chaffee. Resembling a moving star, the light was very low and relatively bright (Fig. 11.1).

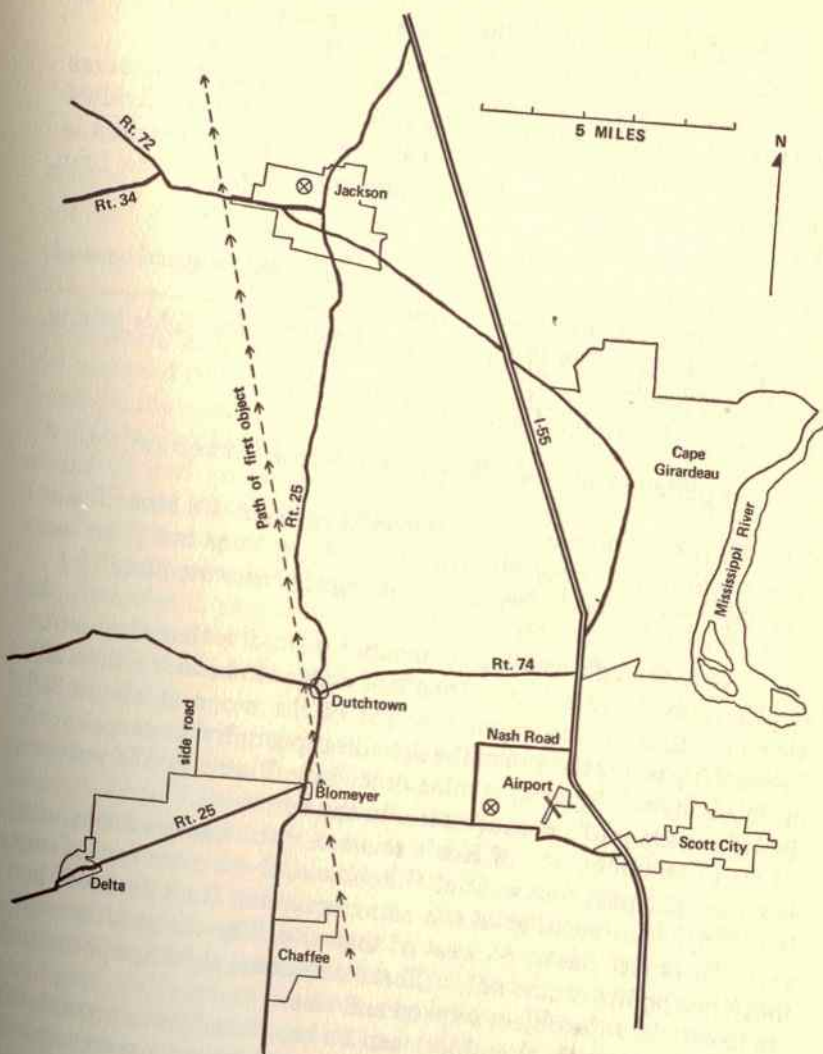


Fig. 11-1

"Dr. Rutledge, that's the damned orange ball we saw at Farmington," John said emphatically. It was the same color.

All of us began to photograph the moving light. Cameras began to click and tape recorders were turned on to record individual descriptions and conversations. A small part of the conversation is given here, beginning about two minutes after the light was first sighted:

H.R.: He's past the moon now. Look at him! Look at him speed up and get brighter. He's rising a little . . . white now.

B.A.: I've got him in the Questar. Look like two lights joining some kind of fuselage.

J.W.: That's what I see in the 800.

A period of silence followed as everyone worked swiftly.

K.A.: There's another light beneath him! A red light. It's beneath him. It's not attached. It's not moving. Oops! It just went out! [Ken was observing through binoculars while making the exposure; Plate 19.]

After the light passed the moon, I started to time the motion by placing my hand in front of the lens every 10 seconds (Plate 20). Aldrich estimated the angular height of the moon at about 35° . Soon after passing the moon, the light disappeared, then reappeared, in clouds; hence, I quit my timing procedure (Plate 21). We watched the light move into a thunderstorm to the northwest.

Fortunately, one of Ken's relatives (who desires anonymity) saw the light pass just west of Dutchtown. Even more fortunately, Paul Hughes, a member of the astronomy club from Jackson, had seen the object pass just west of that city. The distance between those two points is nine miles. These additional sightings permitted me to estimate the object's speed and size.

The speed of the object can be calculated from a graphical estimate of the distance to the object, and from a measurement of the corresponding distance traveled on film during a given time—say, ten seconds. First, the angular speed in degrees per second is calculated, using the four timed exposures (Table VI).

Next, the distance to the object when the exposures were taken is measured from the map. The sightings at Jackson and Dutchtown are located on the map (Fig. 11.1). A straight line drawn from Jackson to Dutchtown (representing a distance of nine miles) is continued (extrapolated) to a point east of Chaffee (another two miles). Now, a line is drawn on the map from the viewing location on

TABLE VI ANGULAR RATE AND SPEED

Lens	Trail Length	Exposure Time (Sec.)	Angular Rate ($^{\circ}$ /S)	Speed (mi/hr)
50 mm	2.8 mm	10	0.32	60.5
800 mm	8.0 mm	2	0.29	54
800 mm	36.0 mm	10	0.26	49
135 mm	11.0 mm	20	0.33	62.4

Nash Road, straight west, until it intersects the extrapolated line, the assumed position of the object when the exposures were made. In effect, the extrapolated line represents the path of the object from Chaffee to Dutchtown. The length of the east-west line on the map is measured and converted to distance—in this case, three miles. Table VI lists four values of speed for four different exposures. The values of speed agree to within 25 percent.

The spacing between the lights is calculated to be about ten feet. As a check, the distance traveled during the 0.1-second exposure was calculated to be eight feet, a value that makes sense, because the trail of the aft light almost touches that of the forward light (Plate 22).

In considering rational explanations, we observe that sixty miles per hour is near the stall speed for many winged aircraft, but a helicopter could fly at this speed. The spacing of 10 feet between lights is not extraordinary because the lengths of helicopters—and aircraft—are normally within the 20- to 50-foot range.

But are there aircraft or helicopters that fly at night exhibiting only two lights of equal intensity, spaced about 10 feet apart? We discerned no flashing anticollision lights and no red or green position lights, as required by FAA regulations. The rear light of the two did not meet these regulations, either, because it could be seen through binoculars, through the 800-mm lens, and through the Questar telescope long before it pulled even with our position. In short, there was no typical rear position light.

One explanation for the momentary presence of the hovering red light (Plate 19) is that a second vehicle was hovering in the darkness. Perhaps the moving vehicle accelerated and rose in altitude to avoid the stationary vehicle. But in contradiction to these explanations, none of us heard any sound during the sighting.

After the object disappeared in the direction of the thunderclouds, we discussed the sighting. At 10:35, a jet passed over at a

higher altitude than the object. Five minutes later, another jet was observed going southwest. We easily made out the individual lights on the jet, which were not nearly as bright as the orange light we had observed earlier. Then John photographed the moon. The rest of us remained on watch, although we didn't expect additional action.

"We've got another one!" Ken suddenly shouted. "From the north, four degrees left of north and low." It was coming over hills about three miles away, at an angular altitude of less than 10° . The time was 10:55, about 45 minutes since the last sighting. Apparently, the amber light would pass directly over us; instead, it swerved to the west of our position (Fig. 11.2). Ken made out five individual red and white lights, plus an additional flashing red light in the center of the object. Although this object appeared to be closer than the first one, we heard no sound. During the transit of the object, each of us took several exposures except John, who had only one frame left.

Aldrich timed the transit of the light across a four-degree binocular field at four seconds for an angular speed of $1^\circ/\text{S}$, about four times the angular speed of the light seen in the first sighting. In my opinion, this second light appeared to be moving much more slowly. Using Ken's measurement, if the object was one mile away, its speed was 63 MPH; and twice that at 2 miles. A speed of 60 MPH is consistent with the fact that this object covered about fifteen miles from north to south during the 15 minutes elapsed since it was first seen to the north until it appeared to stop a few miles south of Chaffee, about 4 miles from our position. The bearing was 190° , 10 degrees right of south. In binoculars, Ken picked out other lights hovering near the one that had stopped.

Suddenly a number of jets thundered into our vicinity. Certainly there was sound now! One of the hovering lights to the south went out. I heard someone (probably Bob) exclaim, "What in the hell is going on here?" We counted at least a half-dozen jet fighters; three were west of us going south. Two jets met overhead; one going north, one going south—a maneuver that puzzled us. Each jet bore a white light on each of its two wingtips, with a red flashing light in the center between the white lights. The time was 11:10 P.M.

It was perplexing that the light that passed across our front seemingly stopped to wait for the jets. To add to the mystery, we received information the next day from Paul Hughes and two friends who saw the object at about 10:50, before we did. Hughes, in a signed statement, wrote: "On the night of Monday, June 4, 1973, I and two other witnesses saw a yellow-white light in the northwest sky from Jackson. It travelled southeast over the city. It apparently

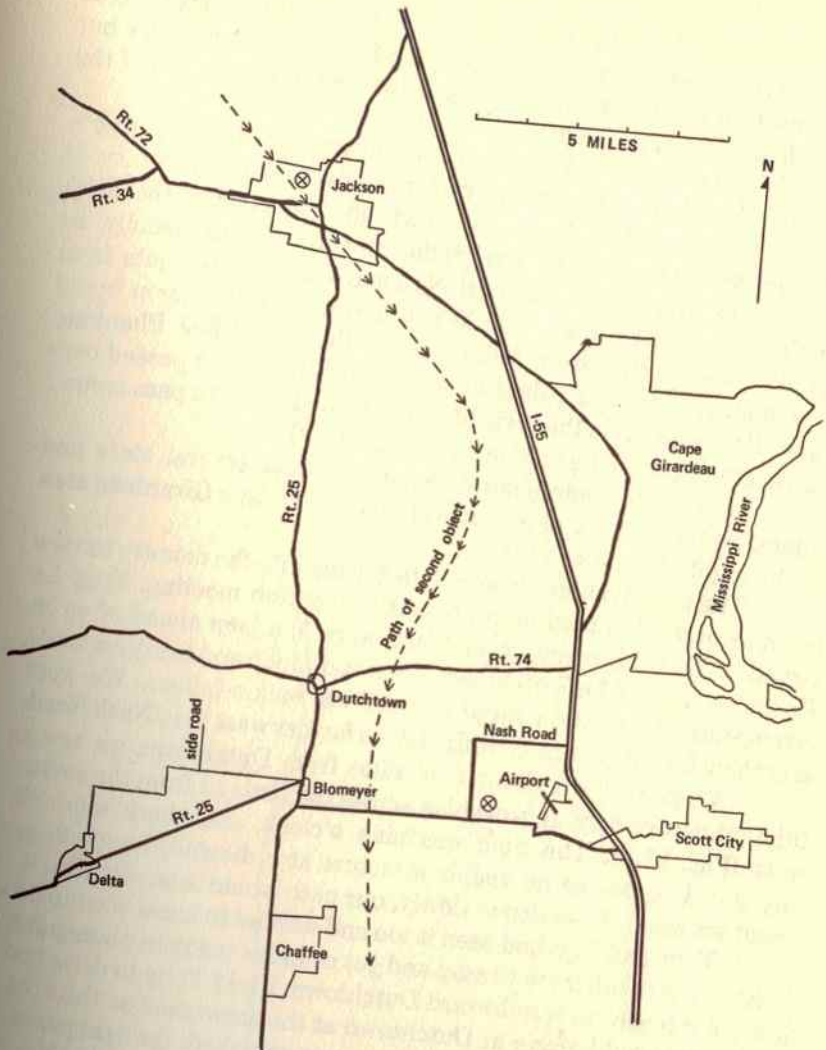


Fig. 11-2

made no noise, and passed over at about an eighty-degree angle. Soon after it passed over, two jets followed it in the same course but at a lower altitude. Our sighting was about ten to eleven. All of the preceding knowledge is true."

We can assume that either the military was investigating a UFO, or that there was a military exercise over civilian territory. If there was a jet-UFO chase over Jackson, conceivably the UFO disappeared from the two jets' radar screens . . . and visually, as well, unless these were Missouri National Guard F-100 jets from Lambert Field, St. Louis. The F-100 had weather radar on board but not target acquisition radar, as did the newer F-4 Phantom. Presumably, after losing their target, the jets may have passed over Cape Girardeau while the invisible UFO turned south to pass around our position, becoming visible again (Fig. 11.2).

None of the administrative personnel at several state and federal air bases know of any operations in the Cape Girardeau area on the night of June 4, 1973.

The next evening we were late getting into the country to view because of a scheduled monthly astronomy club meeting. Tony Le Grand, a SEMAC member, and Bob were in a jeep ahead of us on Route 74, headed for Dutchtown. John and I followed in my car while attempting to maintain radio contact via walkie-talkies. We were searching for a different viewing station farther west than Nash Road.

When we were about four miles from Dutchtown, we saw a brilliant orange light approaching across the flatland from the southwest (Fig. 11.3). The time was nine o'clock, and there was still daylight. I could see no visible structure at a distance I took to be about six miles. If we drove slowly, our path would intersect with it.

Tony and Bob had seen it too and wanted to know what to do. I was about to tell them to stop and get cameras ready to photograph it when it began to turn toward Dutchtown. I told Tony to drive fast so that we would arrive at Dutchtown at the same time as the light. We drove as fast as we dared, but as we approached, the light passed over a hill northwest of Dutchtown. Although we were less than a mile from it, no structure was apparent—just a floating, driven ball of light. I was reminded of a similar ball of light that Glenna Waltrip had seen pass over Piedmont one summer night in 1967.

I was thoroughly perplexed by our sighting. Surely, we should have seen wings or a tail structure. Was it a ball of plasma? I wondered. Then why did it turn away from us? Was that just a coincidence?

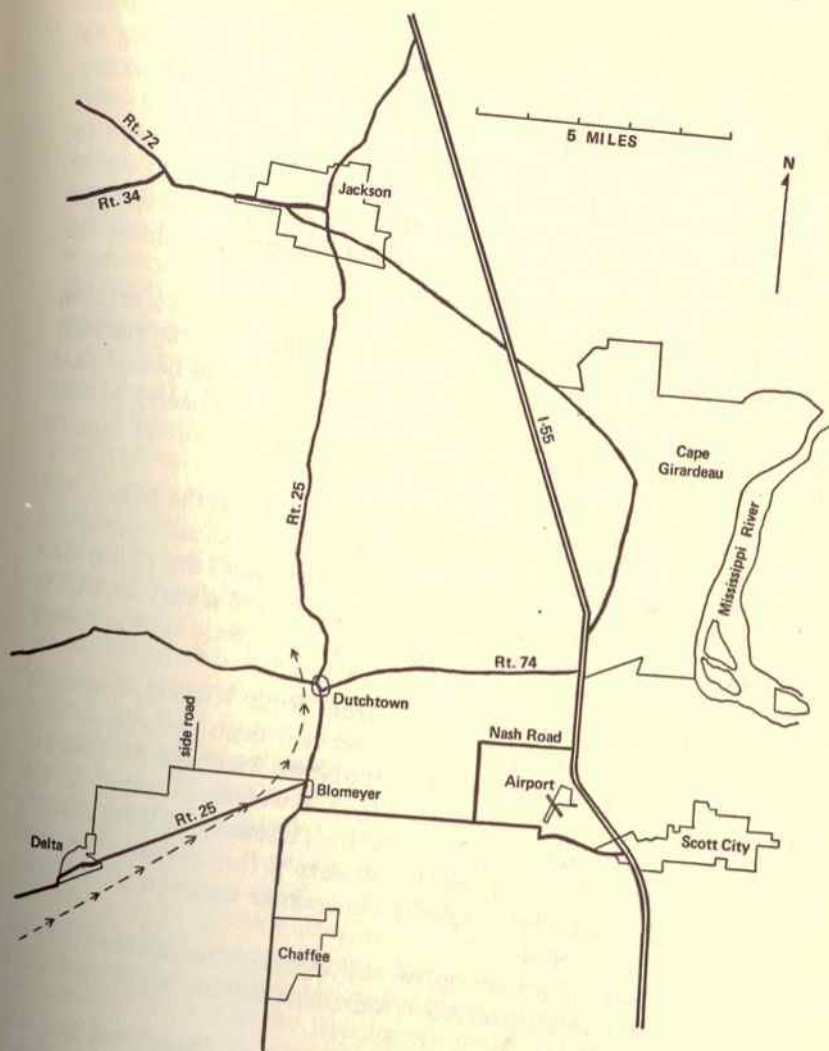


Fig. 11-3

No more UFOs were seen the rest of the evening from a road that I call "Chaffee Road," paralleling Route M. More orange lights were seen on Wednesday night from the same location, but Thursday night was still more eventful.

By 8:25, the equipment was set up. Present in addition to Bob and John were Bill Ownbey, a member of SEMAC, and Debbie Scherer, a University student. Ownbey brought a Celestron telescope with camera attached. Now and then, we saw an orange light in the distance, but no UFOs were counted.

At nine o'clock, a large jet landed at the Cape airport, making a terrible racket. We were only about three miles from the runway. After it left at 9:30, I remarked, "I wonder why we are having that kind of activity around here?" I was suspicious, having been told that jets couldn't land on the short runways, 4,000 and 6,500 feet in length.

Upon checking with the Flight Service Station the next day, I was told that a U.S. Navy jet had landed for medical evacuation purposes. Cape does have a Naval Reserve unit, but I didn't buy that answer. The person giving me the information had a very anti-UFO attitude, although other personnel at the FSS were and are very cooperative.

Quite by accident, I learned from Ruth Withers, owner of Cape radio station KGMO, that the jet had been carrying a VIP, General Seth McKee, commander of the North American Air Defense (NORAD) at Colorado Springs. When I wondered aloud if the general's presence was related to the high intensity of UFO activity in the area, Ruth assured me that it wasn't. But the situation was fraught with possibility; imagine an encounter between a UFO and the commander of NORAD!

As the evening wore on, we saw various lights. Some could be identified as aircraft lights. A few were high-altitude white lights, the color of satellites.

"Those are not satellites!" John argued. "Heck, we saw five in less than fifteen minutes down here last night."

"There's no way we could have that many satellites," Bob agreed. "Besides, we had one going southwest."

But if not satellites, they may have been high-altitude aircraft. According to Project policy, we did not count them as UFOs.

At about 10:00, I began exposing sections of the sky to a camera containing infrared-sensitive film. The camera was an extra one, and the exposures were several minutes in duration because we did not monitor them except to start, time, and stop each exposure.

A Wratten 89B filter placed in front of the lens allowed infrared radiation to pass through to the film, but was opaque to the visible wavelengths. Hence, any pattern on the developed film would have been caused by infrared radiation.

In addition, another Pentax camera, loaded with sensitive black-and-white Kodak 2475 recording film, was aimed in the general direction of the Big Dipper. This was the camera that captured the image of an unseen light on the negative. The first exposure (Plate 23) was 5 minutes in duration. While I was making the first exposure, an automobile approached from the west with bright headlamps, forcing me to terminate the exposure prematurely. The time interval between the two exposures was 2 minutes; the second (Plate 24) was 12 minutes in duration.

For the first exposure, the brightness of the light source was greater than any of the stars in the background; yet it was not seen by any crew member. Probably, the light flared bright when no one was looking in that direction. Obviously, the light was stationary relative to the earth, because its pattern does not exhibit the effect of the earth's rotation as do the star trails in the 5-minute exposure. In the second exposure of 12 minutes, the light apparently moved upward relative to the Big Dipper handle and possibly farther away.

To some, the pattern in Plate 23 may suggest a lens flare, caused by light from the automobile headlamps. A lens flare is caused when light enters a camera lens of several elements (several lenses sealed together as a unit) and is reflected back and forth among the various lens surfaces, eventually striking the film at the back of the camera. Light reflecting from the external portion of the lens barrel in front of the lens, and reflection of light from the internal portion of the barrel, can contribute to flare patterns too. (Multiple reflection among lenses is reduced with nonreflective lens-surface coatings, while barrel reflections are minimized by baffles and black paint inside the lens barrel. Because light can still enter the lens and reach the film via reflections, a lens hood should be employed even for night photography.)²

But in this case, the headlight beam made an angle of approximately 70° with the axis of the camera lens. The estimate is obtained by knowing that the axis of the lens was pointed at the Big Dipper, which was 20° west of the Pole Star at the time. If the pattern in Plate 23 is a lens flare caused by stray light from the headlamps of a car, no light pattern should have appeared in the second exposure, because the car had already passed our position and was no longer a factor.

Could the pattern in Plate 23 have been a lens flare caused by light from a mercury-vapor security light on some nearby farm? The vertical angle of the lens axis with the ground was about 50 degrees. This is estimated from the fact that the angular altitude of the Pole Star is 37.3° , the same as the latitude of Cape Girardeau, and that the "pointer stars" in Plate 23 show that the camera was aimed about 13° higher than the Pole Star—which is directly to the right of the "pointer stars" and does not appear in the exposure. In addition, there were no bright mercury-vapor lights in our vicinity. For the hundreds of exposures made in the Project, no lens flare ever appeared in a photograph for such a high angle of camera elevation, even when night exposures of long duration were made from my yard in the city. A final argument against a lens flare caused by ground lights is that the light pattern in Plate 23 does not appear as a flare in the second and much longer exposure, Plate 24.

As a final check, I returned to the location and repeated the two exposures under the same conditions as those of the original exposures, headlights and all. The negatives showed star trails, but no extraneous light patterns as in the original exposures.

One scientist told me that the pattern in Plate 23 may have resulted from light scattered by a dust particle on the lens. According to the late Dr. Donald Menzel, prominent Harvard astronomer, dirt on a lens will rarely cause a problem, since it is out of focus.³

I later learned that there was a comet in the same sector of the sky as the Dipper. On consulting the magazine for amateur astronomers, *Sky and Telescope*, I knew that I had not photographed Comet 1973b. Besides, comets do not perceptibly change their position relative to the stars in 20 minutes.

Another person, about two months earlier and 75 miles away, had made an exposure similar to that in Plate 23. On the night of Saturday, April 28, Maude Jefferis had her Crown Graphic portrait camera, loaded with Royal Pan film, on the patio of her home. At about 10:00 she saw a light high in the sky. She told me that she took a 1-minute exposure, although analysis of star trails suggests an exposure time closer to three minutes (Plate 25).

While at home a few days later, I stepped outside into the front yard just before dark because low dark clouds were rolling over the city. A storm was imminent. I had been asked if UFOs are seen under clouds or near storms, and I wanted to observe until the rain came. My wife joined me, and we scanned the sky for about 15 minutes before thunder and lightning told us to go inside. As we turned to face the house, my wife and I saw a well-defined red flash

of light just under the clouds. Although the duration of the flash was short, it was unmistakable. No solid object was discerned, although city lights reflecting off the clouds gave ample illumination. This was the first sighting from my front yard—but it wasn't to be the last.

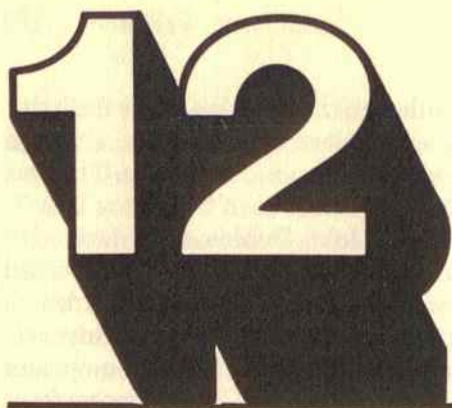
On the night of Friday, June 8, John, Debbie, and I decided to set up our equipment farther west than usual, having observed amber lights in the west earlier in the week. We drove to Arbor, a small town on Route 25 about half-way between Delta and Advance. Turning south, we found an open field and set up our equipment near a drainage ditch containing stagnant water. Gigantic mosquitoes made ferocious attacks on our bodies. Although beautiful to observe, the thousands of lightning bugs made night viewing difficult. Those that glowed 200 to 300 feet above us diverted our attention. In all, the evening was a dud.

As we put our equipment away, I said, "Well, John, it had to end sometime. I guess this about does it for the summer."

Fortunately, I was mistaken.

NOTES

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- R. B. Rhode and F. H. McCall, *Introduction to Photography*, 2nd ed. (New York: Macmillan Publishing Co., Inc., 1971), p. 13.
- Phil Davis, *Photography* (Dubuque, Iowa: Wm. C. Brown Co., Publishers), pp. 3, 17.
2. Lens Test Glossary, *Popular Photography* (June 1973), p. 82.
- "A Flair for a Flare," *Modern Photography* (June 1975), p. 82.
- Bennett Sherman and Hiroshi Kamata, "Multicoating: Asset or Gimmick," *Modern Photography* (June 1975), p. 90.
3. Donald H. Menzel and Ernest H. Taves, *The UFO Enigma, The Definitive Explanation of the UFO Phenomena* (New York: Doubleday & Co., Inc., 1977), p. 189.



A BULLET-SHAPED OBJECT VANISHES IN DAYLIGHT

On Monday, June 11, 1973—three days after our bout with mosquitoes and fireflies in the field near Arbor—summer school began at the University. While resuming my duties as chairman of the Physics Department, I made plans to assemble and organize my data for analysis. Jim Sage hadn't yet prepared his data for analysis either. According to my contract with the *Globe-Democrat*, I had to report our findings to the scientific community and to supply the newspaper with information for an article.¹ Several months would be needed for even a preliminary analysis; hence, we didn't plan to go into the field again. But my attempt to resume the normal lifestyle of a professor—staying inside at night and not in some field or on a mountaintop—was short-lived.

The following Friday night, while John Wilson and Debbie Scherer were strolling in Capaha Park, John saw a big bright light south of Cape Girardeau. Although it was as big and as bright as Jupiter, he knew it wasn't Jupiter, which was visible farther west. Besides, the light couldn't have been a planet; it was moving south! The Class B sighting put us into the field again.

The next evening, Bob, John, and I set up on Nash Road. There was a distant thunderstorm in the west, reminiscent of other nights, but by the time we quit at 2:00 A.M., the storm had dissipated before reaching us. Our score for the evening was a few exposures of the moon and Jupiter and a number of mosquito bites. Nevertheless, we decided to return to field work for several consecutive nights. These following accounts are capsuled here from tape recordings made in the field.

On Sunday, June 17, the three of us had again set up on the road near Chaffee when we picked out an object in the southwest, traveling north. In the Questar telescope, Bob could make out three white lights and a flashing red light. When northwest of our position, at 10:20, it brightened and went out. This Class B UFO had been in view for five minutes.

At 10:50, we had a reenactment of the sighting except that the object was going south. The light went out in the southwest, qualifying it as a Class B UFO. We quit at midnight.

The next evening we set up on Blomeyer Road, about seven miles west of the Cape airport, well out of the approach pattern for aircraft landing there. The flat bottomland afforded an unrestricted view. Farm lights were not much of a problem, road traffic was light, and the location was to become our favorite for the Cape Girardeau area.

At 10:13, we picked up two satellites traveling southeast. At the zenith, their paths crossed. One went out. A few minutes later, a third satellite came through the constellation Corvus, going southeast. We thought that three satellites within a five-minute period was a little unusual.

At 10:55, a storm moved in, causing us to leave in a hurry. Since our arrival before sundown, our only guest had been a farmer distributing chemical fertilizer on a nearby field.

The next evening, Tuesday, June 19, was one of those I'll never forget. The time was 7:12 P.M., CDT—still daylight. I was standing by the door of my yellow Mustang, having just loaded it with the equipment for another night in the field. I had laid a camera, binoculars, and tape recorder on the front seat, ready for use. I turned back toward the house. Then I saw it!

To the east, from behind intervening trees, appeared a dull gray object. At first glance, I thought it was a small airplane flying straight and level at slow speed—private planes frequently approach the Cape airport by flying down the river past the city. Then I

realized that the object was no airplane. To borrow a phrase from the many persons who have reported UFO sightings to me, "It was not like anything I had ever seen before."

I looked at the craft. It had no wings. I did a double-take: It had no tail structure either. I looked again. The stubby, untapered body and flat rear reminded me of a .45 caliber bullet (Fig. 12.1).²



Fig. 12-1

Quickly, I decided to estimate its angular width, view it in detail through 10X binoculars, and photograph it. Facing the object, I extended my left arm, framing the object between thumb and forefinger. Immediately, the object changed from a dull gray to a light green (olive drab) color. Then I snatched my binoculars from the car, consuming not more than two seconds. When I looked up, the object was gone—vanished! The blue sky was empty; I checked it everywhere. A slight feeling of nausea overcame me. Any lingering doubt I had about the existence of UFOs had vanished with the object.

Nonetheless, there was work to do. When I drove into John's driveway, he approached the car.

"Dr. Rutledge, what happened to you?" he exclaimed.

"I . . . uh . . . I've seen something," I stammered. "In broad daylight, too."

"My gosh, you're as white as a sheet."

"I feel odd, John," I admitted, then described the sighting to him.

"Boy, that's really something," he said in a low voice. "Wait till Bob hears about this."

John told me that the weather radar at our local TV station was showing a severe thunderstorm southwest of the city; hence we decided to spend the evening in the University darkroom developing film and making prints.

The size of the object can be estimated, knowing the angular size of the object and the distance to it. An estimate of the angular size was obtained from the spacing between my thumb and forefinger framing the object, with the arm fully extended. My estimate of the thumb-forefinger spacing was three-quarters of an inch. So as not to overstate the case, I assume the spacing to be one-half inch. The

object appeared to be near the Mississippi River, about 2 miles away. From these estimates, the calculated length of the object was 210 feet.

A similar shape has been reported infrequently in the UFO literature. On October 15, 1948, the pilot and navigator of a U.S. Air Force F-61 Black Widow dueled an object near Fukuoka, Japan. Shaped like a rifle bullet, the object tapered to a square-cut aft end. Following it in radar, the pilot would close the distance, only to have the object speed up to 1,200 miles per hour. On one occasion, it made a 180° turn followed by an up-and-down motion.³

At 7:20 A.M., February 19, 1951, the radio officer of an East African Airways airplane saw a bright white "star" hanging motionless about 10,000 feet above Mount Kilimanjaro. Through binoculars, he saw a bullet-shaped object he estimated to be more than 200 feet long. After 17 minutes, it began to rise, disappearing at an altitude of about 40,000 feet.⁴ On February 6, 1953, a U.S. Army weather officer stationed on Truk Island in the Pacific saw a bullet-shaped object without wings or tail overhead at midday.⁵ In January 1966 a number of persons on the northwest side of Omaha, Nebraska, sighted a stubby cigar-shaped object.⁶

A University student told Dr. Sage that the McDonnell Douglas Corporation in St. Louis was flying a prototype model of the space shuttle to New Orleans and back on a weekly basis. Presumably, these were training flights. The informant had gotten his information from his brother, who was employed at the firm. Knowing that the firm was bidding for the contract to develop the space shuttle system, I wrote a letter of inquiry to McDonnell Douglas. A spokesman informed me that they did not have any "experimental flying models of the space shuttle." In fact, they weren't even building the shuttle; that contract was awarded to Rockwell International, El Segundo, California. In closing, the spokesman assured me that "if UFOs are flying in Southeast Missouri, they do not originate from McDonnell Douglas."

To be sure of my facts, I wrote to a scientist friend employed at McDonnell Douglas in St. Louis. His reply affirmed the content of the spokesman's letter. Now I couldn't explain away the bullet-shaped object.

The same evening, although a thunderstorm lay foreboding to the southwest, Bob Adams decided to drive to Blomeyer Road to look, taking son Doug along. Soon after they turned off Route 25 onto Blomeyer Road, they saw a yellow-orange light approaching from the southwest. Bob stopped the car, got out, and examined the light through binoculars. He could see no detail. Next, he began to

take exposures with a Pentax camera with 80-mm lens while Doug observed with binoculars. When the light was over the road in front of them, it suddenly swerved sharply to the northwest. They jumped into the car and pursued the light at speeds up to 65 miles per hour on the narrow rock road. The light pulled away from them and "blinked out," and did not reappear (Fig. 12.2).

Again we have a case where a bright light floats noiselessly across the twilight sky, with no structure visible. Again we have a course change, in apparent reaction to observers on the ground. Bob told me that the light was brighter than the one we had observed coming across the same area toward Dutchtown on June 5, except that in this case, the sky was darker. The light in the sky may have appeared brighter because Bob's eyes were partially light-adapted.⁷ The uninitiated will suggest a plasma ball arising from natural causes in the thunderstorm.⁸ This hypothesis I reject totally, as later experiences will show.

The next night we were set up on Blomeyer Road again. Our field unit consisted of Bob, John, Bill Ownbey, Rick Kuntze and me. We logged a few aircraft and two satellites. At 11:13, we observed a Class B sighting—two dim white lights that appeared to meet on line under the lower left star of the constellation Cassiopeia.

On Thursday night at Blomeyer Road, our field unit consisted of Bob, John, Bill, and me. At 9:20, we thought that we were observing a satellite, but it changed direction. Bob said, "That ain't no airplane. All I got [in the Questar telescope] was a round, yellow ball, almost white."

Two more satellite-like lights passed over within a few minutes. At 10:15, I saw a light low in the south-southwest. After examining it through the 800-mm lens, John said, "Bright light in front and dimmer one behind." The light, several miles away, approached almost on line with us. After a long period of silence, I aimed my seven-cell flashlight at it. At that instant, the light turned from its northeast path to a northwest path, a change in direction of 90°. Was this a reaction? A coincidence?

At 10:27, we logged another satellite passing overhead to the north-northeast. After sighting an airplane to the east, Bob picked out a high-altitude light passing through the constellation Leo. The time was 11:07. The light brightened and went out, uncharacteristic of satellites, which fade out gradually when entering the earth's shadow. After seeing more aircraft, we quit at 11:30.

On Friday and Saturday nights, we observed satellites and aircraft. The sky was very active on both nights, but no UFO sightings occurred.

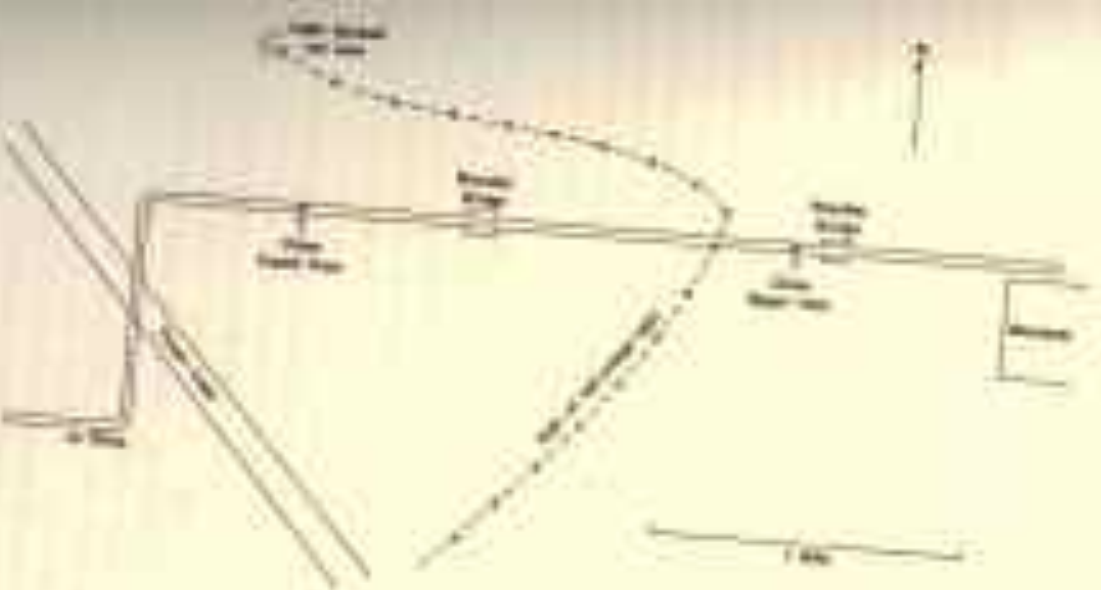


Fig. 1.1.1. A cross-section of a bridge showing a curved top surface. The diagram is oriented vertically on the page. The dimensions are labeled with letters: 'H' for height, 'L' for length, and 'W' for width. A dashed line indicates a curved path or boundary.

A week elapsed with no field trips. On Thursday, June 28, my son Mark stepped outside to check the night sky. Fifteen minutes later, he called me. West of the city, a bright orange light was traveling north at a fast pace. I rushed inside to procure camera, lens, and tripod, which were already mounted, but when I returned, the light was masked by a line of huge trees across the street.

Then Mark noticed a second light of identical color—east of the city going north, our second sighting. From the middle of the street, I took two time exposures of 30 seconds on 2475 recording film. (Luckily, no cars came!) The whole affair lasted 6 minutes, starting at 11:13, when Mark spotted the first light, to 11:19 when the second one passed over a far ridge out of view. I wondered if the two lights were a pair.

Moving the equipment to the front lawn, I continued to watch the sky. At 11:30, I saw a stationary xenon-type strobe light northeast of Cape in the direction of Trail of Tears State Park. After taking a couple of exposures, I went into the house, changed clothes, and drove 8 miles closer to the flashing light, stopping alongside the road that borders the Junior Chamber of Commerce golf course on the north. The strobe lights were visible at about a 40° vertical angle. I turned off the headlights.

When I opened the door to get out, the car's dome light came on. As if reacting to the signal, the strobe light to the north started toward me—causing a mild apprehension on my part. I waited. When the object passed overhead, I could hear the sound of a gas-turbine engine. The object was a helicopter—but its colored lights did not conform to FAA regulations.

The next day I went to the Flight Service Station at the airport to check the flight log. There was no record of a helicopter in the vicinity, but helicopter and airplane pilots aren't required to file flight plans for local flights. I did wonder why a helicopter was hovering in the darkness with only an anticollision light showing. To me it didn't make sense: if the pilot wanted to be clandestine, he should have turned off all his lights.

At the airport, the flight log showed that at 11:32, a Cessna 210 left the airport for a checkout flight. The pilot was T. E. "Gene" Brackett, a friend of mine from Jackson. Fortunately, Gene was in the Flight Service Station that morning, preparing to make a flight to Georgia. When I asked him about the orange light west of the airport the previous night, he told me that he had seen it, but didn't pay much attention to it because he was working with a malfunctioning nose wheel.

On his return from Georgia, Gene gave me a written, signed report stating that he was flying over Runway No. 02 while checking his landing gear. His heading was 280 degrees, airspeed 135 miles per hour, and altitude 300 feet. He saw the orange ball of light to the west off the nose of his plane. It moved north swiftly, stopped, and then moved out of his line of sight. (I noted that his time of observation was later than ours from the street.)

Of course, the sighting aroused our interest in field trips again. Saturday and Sunday nights we observed from Chaffee Road, but everything that we saw was identifiable.

Over the weekend, Drake Kambitch informed me that he and Steve Huffman had observed orange lights from a rock quarry, where they frequently went swimming, in the vicinity of Oak Ridge. This small town of about 180 inhabitants lies about 12 miles up I-55 from Cape and 2.5 miles west on Route E. I decided that we should observe from that location.

On Tuesday, July 3, we loaded two cars with equipment. Bob and Doug Adams, Bill Ownbey, John, and I left early to locate the rock quarry before dark. David Aubuchon, a young member of SEMAC, and Paul Hughes would arrive later. I followed the directions prescribed by Drake: take I-55 north to Route E, turn west on Route E until a certain side road appears. I found a side road, all right; the hills got steeper and steeper, with tall bordering trees. After a considerable drive north, we turned sharply east, where the view opened straight ahead somewhat.

Suddenly, an amber light crossed our front, above trees ahead where the road turned north again. Immediately, I stopped the car, got out, and took an exposure of the slow-moving light. When it disappeared from our narrow view, I got back in the car and speeded to the next turn up the hill. To our surprise, after turning north, the view on the right opened to pastureland. There was I-55 not more than a half-mile away; we were looking down on it slightly. But where was the light? It was gone! I estimated that not more than 30 seconds had elapsed from the time I jumped into the car, which was still running, until we saw I-55.

In my opinion, the light couldn't have been more than 1,500 feet above the highway. This sighting confirmed reports I had received concerning lights flying up and down the highway. This sighting was similar to the Dutchtown sighting on June 5 and the Blomeyer sighting by Bob and Doug on June 19: no structure was discernible, and we were less than a mile from the light in each of the three cases. For this sighting, no thunderstorm was present to create

a lightning-produced ball of plasma. Not one cloud dotted the clear blue sky. Again it seemed that a performance was for our benefit; a vignette. Or was this merely a coincidence?

We never found the rock quarry. Instead, we circled through Oak Ridge and drove east on Route E toward I-55. We found a driveway with a wide entrance, leading to a home nestled in the woods. Here, we began to set up our equipment so as not to block the driveway . . . and we were on state property.

While we were still setting up, David and Paul arrived. They hadn't found the quarry either. Across the road from us was a small white frame house; a teenage girl kept coming out the back door and going back in again. Two or three of the young single men in our group naturally cast glances in her direction. The frequency of her appearances increased, while her father and brother eyed our group from their front yard.

When we finished setting up, I walked across the road in semidarkness to tell the family what we were doing. As I approached the front door, I was startled when the man appeared out of shadows from behind a tree. I should have known he wouldn't believe my explanation that we were doing astrophotography.

About 20 minutes after I returned to our group, two cars approached from the east, in the direction of I-55. We watched their headlamps as they approached. Suddenly, when they were about 200 feet from us, each car turned a spotlight on us. We were blinded, transfixed; our night vision gone. The two cars careened into the drive, one after the other, and slid to a stop. My anger was rising until I saw a huge man leap out of the first car, his right hand resting on a gun holster. "All right, boys," he commanded in a stentorian voice. "Hold it there!" It was a dramatic moment.

A man got out of the other car. I was very apprehensive until I read the word SHERIFF on the side of the first car. I identified our group and explained our mission as astrophotography, just as I had done across the road. The spotlights were turned off; I was relieved. Next, the huge officer accused us of trespassing on private property. I requested that he look at the fence defining the highway right-of-way. (Having worked in the highway departments of two states, I knew that we were on state property, not private property as he alleged.) He agreed that we were not trespassing. We learned later that the entire sheriff's department had been summoned to Oak Ridge the previous Saturday night to an altercation involving several drunken youths.

Bob, in his inimitable friendly manner, invited the officers to take a tour of the heavens through the telescope. He showed them planets, stars, nebulae, and star clusters. As time passed, the lawmen became our friends. Finally, one talked of his days in the Air Force and of his own accord, he began to discuss UFOs. We smiled, listened, and remained noncommittal. Meanwhile, we worried that a UFO would come into range during their presence. After they left, we laughed about their interest in UFOs and wondered what their reaction would be when the results of our study were publicized.

A few minutes later, Bob did see three high-altitude lights north of our position. Two of the lights were approaching, coming south, while the third light was going in the opposite direction. They met, the single light going between the approaching lights. The three lights resembled the color and brightness of a typical satellite. If we were observing satellites, they had to be in polar orbit. We did not count the lights as UFOs.

The continuing presence of UFOs was surprising. Certainly, the events in June committed us to maintain field research. Of course, we had no way of knowing when or how the flap would end.

On Thursday, July 5, I decided to vary our strategy; we would set up north of Cape Girardeau instead of southwest. John, Mark, and I were late getting started, so we didn't have much daylight left to search for a viewing station. Consequently, we chose the J.C. golf course, approximately four miles north of my home, and set up near the ninth green. John had the 800-mm lens camera system, and my camera had a 500-mm lens, on loan to me for the summer from Rich Kuntze. Both cameras were mounted on D & S tripods and were loaded with GAF color film, ASA 500.

After we set up, I suggested that we should check for undulating (wavy) flight. The literature of UFOs is replete with descriptions of undulating flight, and in early June, while set up near Chaffee, one of the lights I had seen had appeared to undulate. But I couldn't be sure that the wavy line I found on the film was not caused by camera vibration.

The moving mirror of the single-lens reflex camera is a major cause of camera vibration, especially noticeable when a telephoto lens is used. I decided to eliminate that problem simply by masking the lens, so that no light entered the camera during the two to three seconds needed for the vibrations to damp out and disappear. Then, any wavy lines in the exposure would presumably be actual motion of the light photographed—unless external conditions, such as the

wind blowing or a bumping of the system, caused new camera vibrations. I found two pieces of opaque cardboard to place in front of the lenses. I gave one piece to John, keeping the other for myself.

We didn't have long to wait. At 9:30, when it was nearly dark, an orange light was spotted low to the southeast, traveling north, apparently along the path of the Mississippi River. Following the procedure I had outlined, John and I began exposures of several seconds' duration. Obviously, the light was flying a level course, with no undulations. Finally, a few seconds before the light would go behind a distant ridge, I told John not to take any more exposures because when developed they would show nothing but straight trails of light.

We let go of our cable releases. To our amazement, the light began to undulate up and down as it moved along (Fig. 12.3). The amplitudes of the motion were quite pronounced. Before we could grab our cable releases and cock the cameras, the light passed behind a ridge. Was this all a coincidence? Or was there a reaction to our presence? After all, I hadn't planned to check for undulating flight until we were set up.

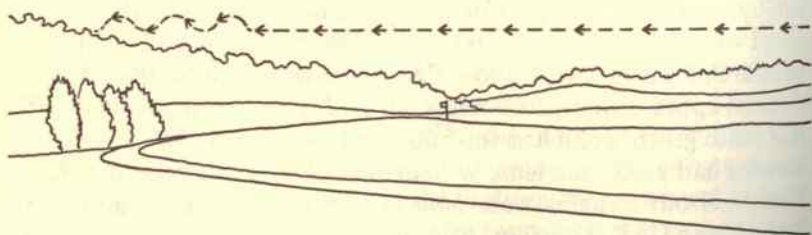


Fig. 12-3

Nothing unusual was observed on the nights of July 6 and 7, but the night of July 8 provided a rare spectacle: an apparent violation of a law of physics.

At 9:30, with only a hint of twilight remaining, I was set up in my front yard. About 9:45, as I was facing northwest, I saw an eastbound satellite overhead. I made a 30-second exposure, but it faded out in the northeast before the exposure was completed. I had no reason to believe that it was not a satellite, but I wondered why I hadn't seen it sooner. Of course, satellites contrast better with the sky after they have passed the zenith because then they are opposite the sun from the observer's point of view. At any rate, I looked to the west, ready for another one should it appear.

Less than a minute later, I saw a satellite approaching the handle of the Big Dipper on the same course as the first one (Fig. 12.4). I surmised that it was part of the same system—possibly a booster rocket or something, although there was no tumbling effect, just a steady light. But a second later, that explanation was laid to rest.

When the satellite reached the stars Alcor and Mizar, in the Dipper handle, it instantaneously made a right-angle turn—a square corner! Traveling east at one instant, in the next instant it was going south. The now pseudosatellite continued toward the star Arcturus. When about a degree of angle from the star, the moving light went out. The transit time from the turning point in the Dipper handle to its disappearance was approximately twenty seconds; I timed it counting by thousands.

Other persons had described instantaneous right-angle turns to me. Now, I had seen one. I wondered how many of the lights we had labeled satellites in the field really *were* satellites. And since I teach Newton's laws of motion in a freshman physics course, the apparent abrogation of Newton's Second Law of Motion had a profound effect on me.*

**Newton's First Law of Motion states that an object will not speed up or slow down unless acted on by a force. An object that speeds up or slows down is said to accelerate. A car that can accelerate from rest to 60 miles per hour in 7 seconds has twice the acceleration of a car requiring 14 seconds to reach 60 miles per hour from rest. The inverse process is an application of the brakes to bring the car to rest—a reverse acceleration sometimes called a deceleration.*

To produce acceleration, a force is needed, like the push or pull provided by a car engine or its brakes. A more massive object requires more force to produce the same acceleration. For example, twice as much force is required to accelerate a two-ton vehicle to 60 miles per hour in 7 seconds as is required for a one-ton vehicle. Or, twice as much force is required to accelerate a car from rest to 60 miles per hour in 7 seconds as is required to accelerate an identical car to 60 miles per hour in 14 seconds. Obviously, more force is needed to move a heavy (massive) object than a light one. These statements are embodied in Newton's Second Law of Motion: force equals mass multiplied by acceleration ($F = m \times a$).

Everything said about acceleration and force in straight-line motion also applies to turns. Assume an object traveling at 1,000 miles per hour makes a turn, a change in the direction of motion. The turn cannot occur without a push or pull force on the object. The tighter the turn (smaller turn radius R), the more force is needed. In fact, the force F is inversely proportional to the radius of the turn: F varies as $1/R$. If the object makes a square corner turn (what I call an instantaneous right-angle turn), then the turn radius is zero, and the force needed is infinite—a physical impossibility!

But by the same token, instantaneous starts and stops are also

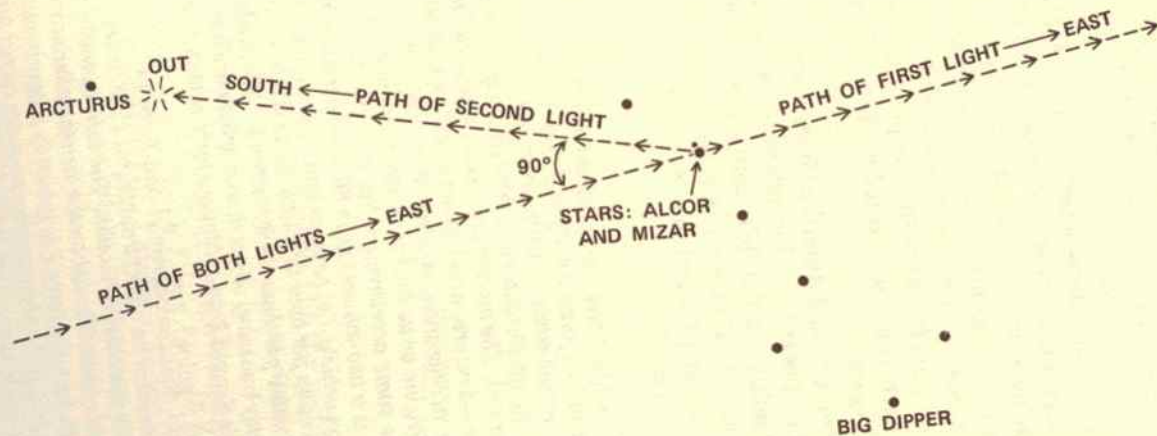


Fig. 12-4 A satellite passed from west to east "through" the stars Alcor-Mizar in the Big Dipper, continued eastward, and faded out in the earth's shadow. A second "satellite" soon followed, but it made an apparent instantaneous right-angle turn, traveled south to the vicinity of Arcturus in 20 seconds, and went out.

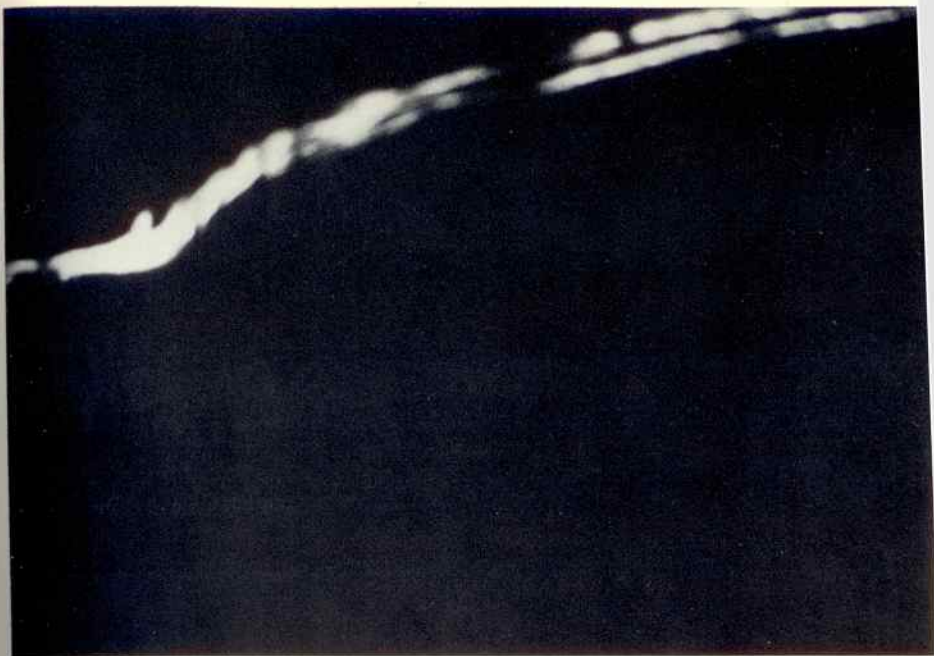


Plate 1. A 6-second exposure of a single ball of light moving right to left. The upper trail is orange, the lower trail yellow. Film: Kodachrome, ASA 64 (copied using Ilford HP-5). Lens: 45 mm, $f/1.7$. (By permission of Robert J. Nistler)

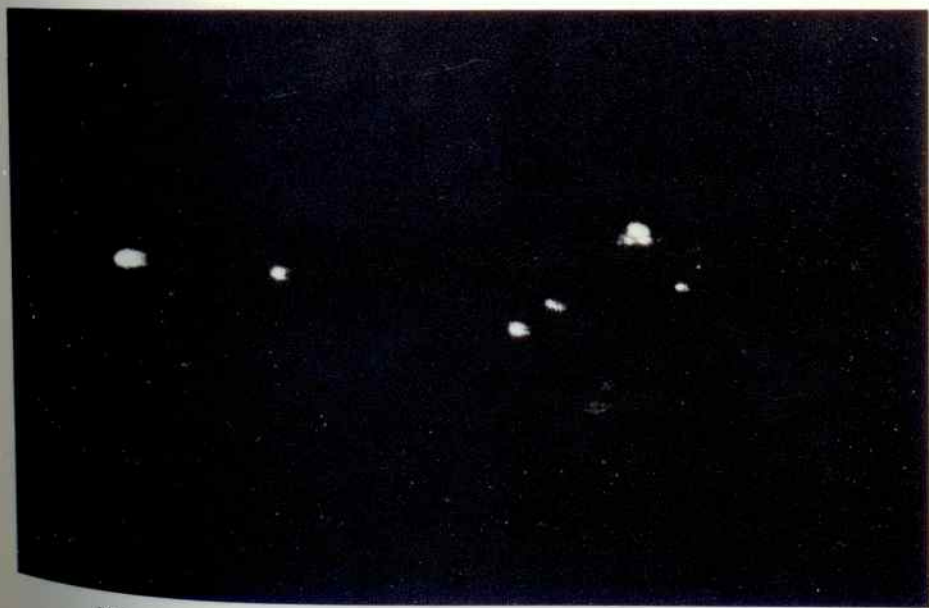


Plate 2. A 10-second exposure of a single ball of light moving right to left. Note several lights rather than the expected single trail. Film: Kodak 2475, ASA 1000. Lens: 35 mm, $f/3.5$. (John Wilson)

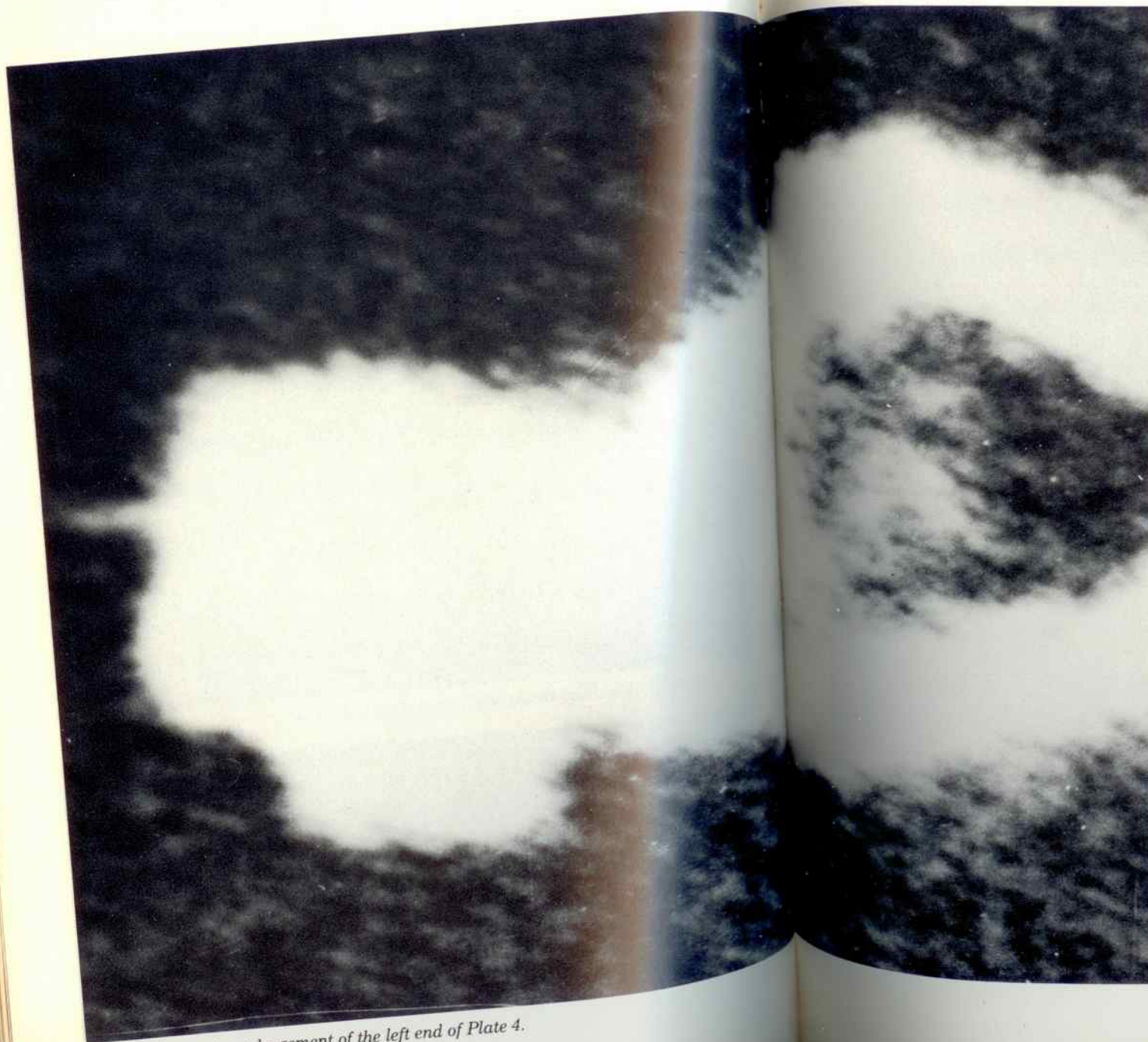


Plate 8. An enlargement of the left end of Plate 4.



Plate 9. A 1-minute exposure of a light hovering southeast of the Farmington Airport. Film: Kodak 2475, ASA 1000. Lens: 800 mm, f/8. (Wilson)



Plate 10. A second 1-minute exposure of the hovering light in Plate 9, taken 15 minutes later. (Wilson)

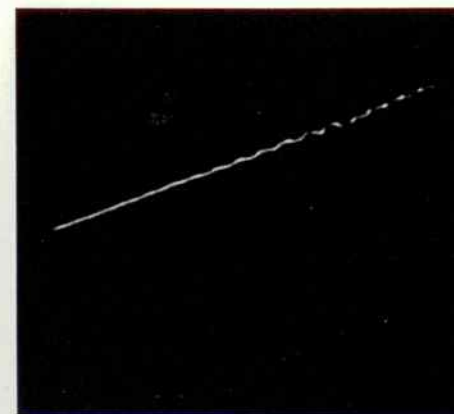


Plate 11. A 9-second exposure of the light as it moved left to right (north). (Wilson)

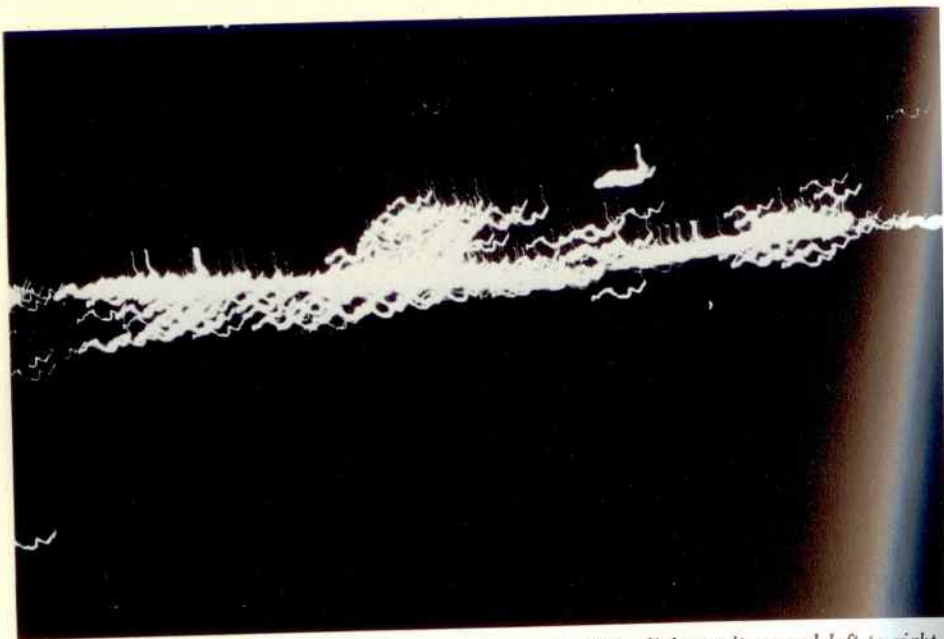


Plate 12. An approximate 1-minute exposure of the light as it moved left to right (north). Film: Kodak Tri-X, ASA 800. Lens: 50 mm, f/1.4. (Author)

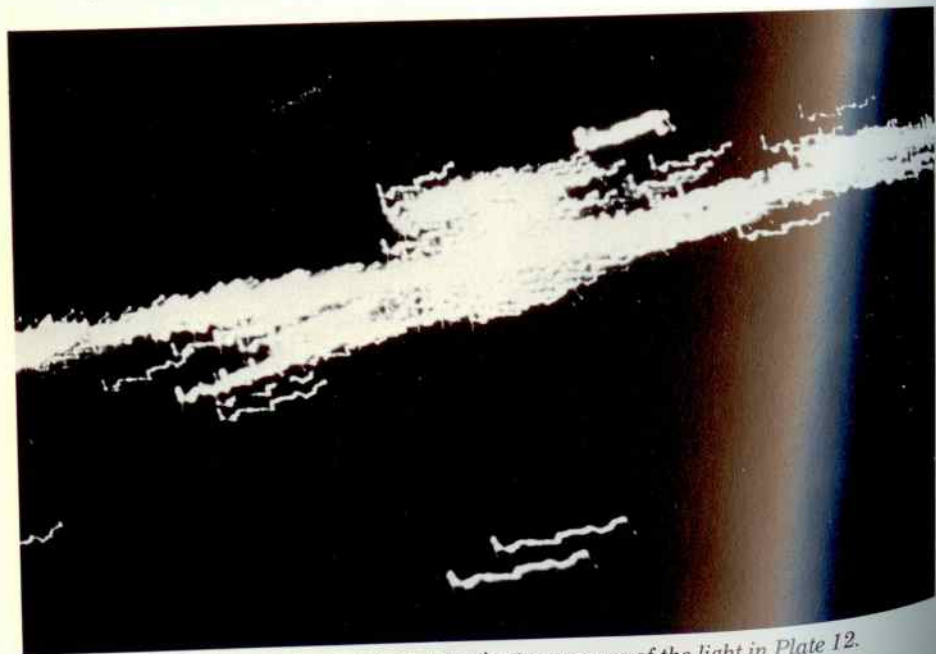


Plate 13. A second approximate 1-minute exposure of the light in Plate 12.

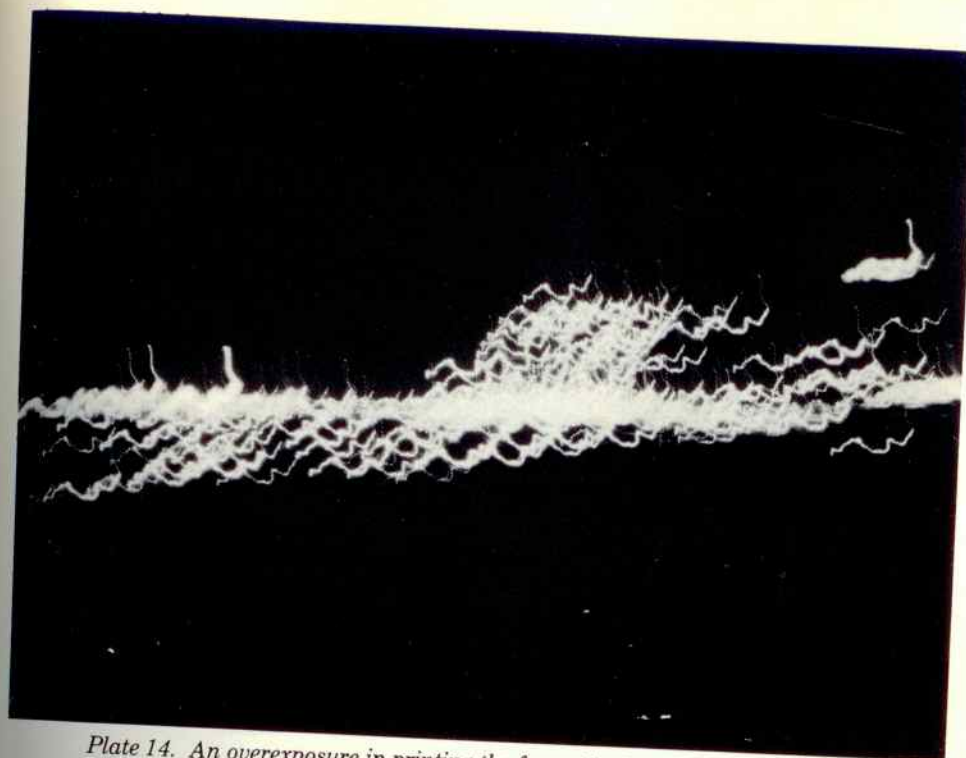


Plate 14. An overexposure in printing the frame for Plate 12; 5 minutes at f/11.

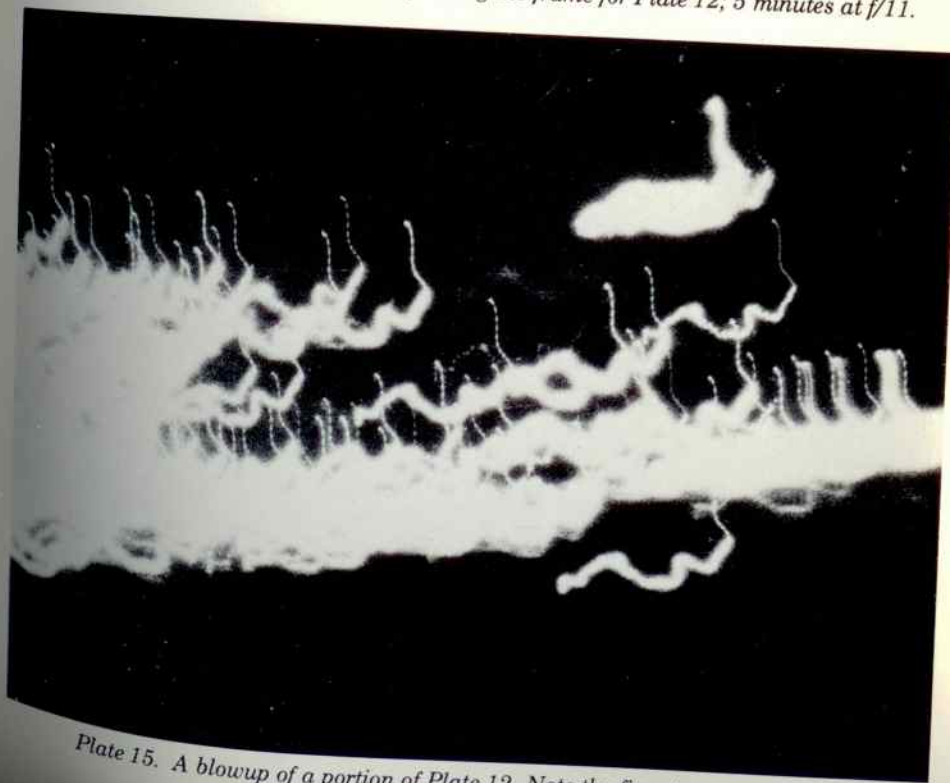


Plate 15. A blowup of a portion of Plate 12. Note the fine structure.

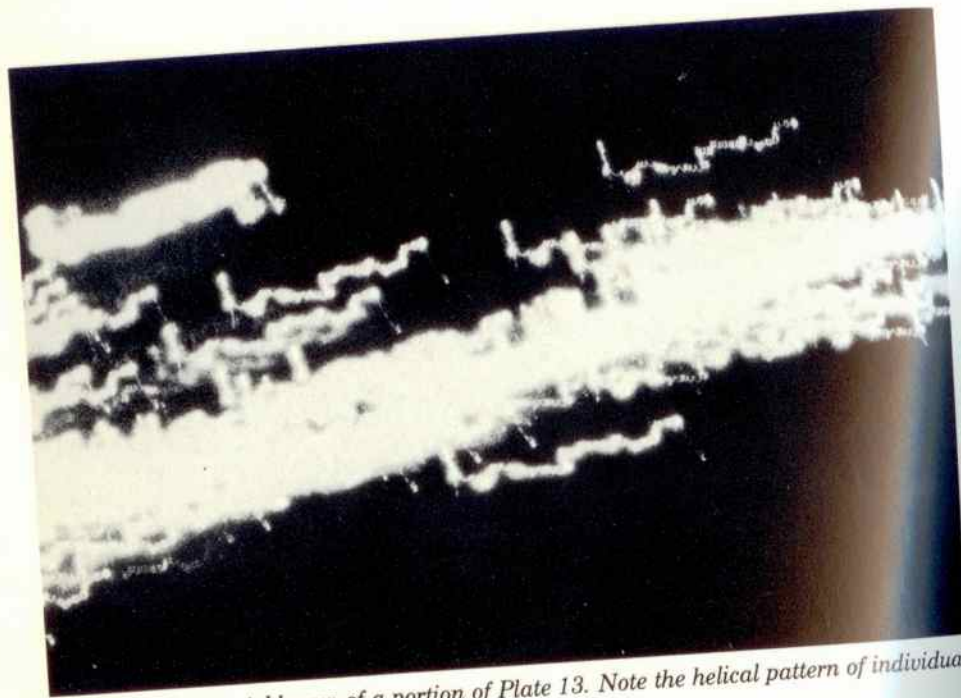


Plate 16. A blowup of a portion of Plate 13. Note the helical pattern of individual light trails.

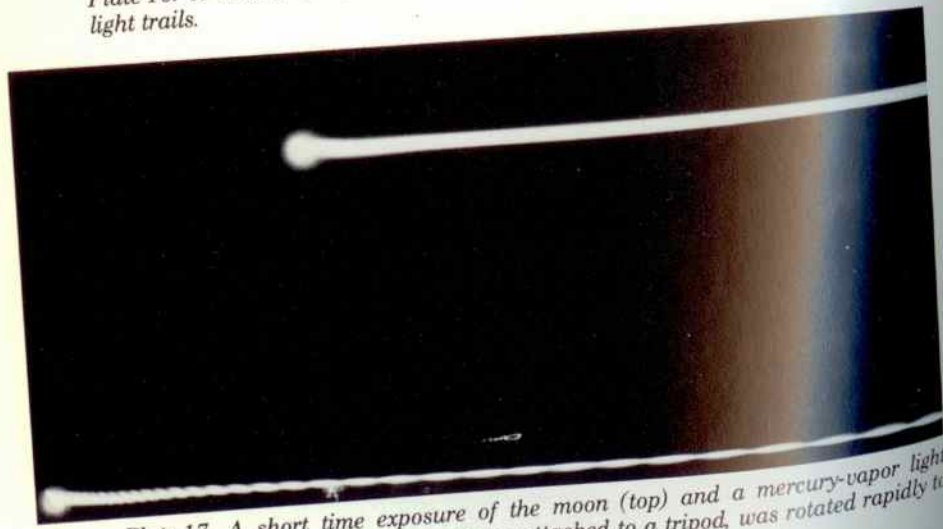


Plate 17. A short time exposure of the moon (top) and a mercury-vapor light (below); for comparison. The camera, attached to a tripod, was rotated rapidly to the left. (Author)

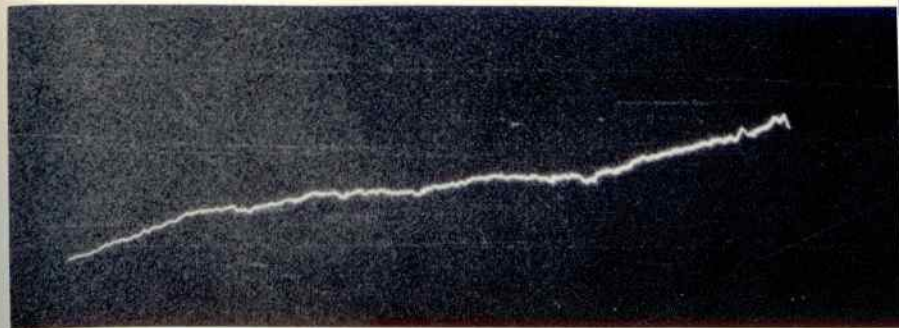


Plate 18. A 15-second exposure of a pseudostar that "jiggled" when observed through binoculars, moving left (north) when the exposure began. Film: Kodak Tri-X, ASA 800. Lens: 50 mm, $f/1.4$. (Author)



Plate 19. During a 20-second exposure of a light moving northwest, a stationary red light appeared for about 5 seconds. Film: GAF 500 (copied on Ilford HP-5). Lens: 135 mm, $f/3.5$. (Kenneth Aldrich)

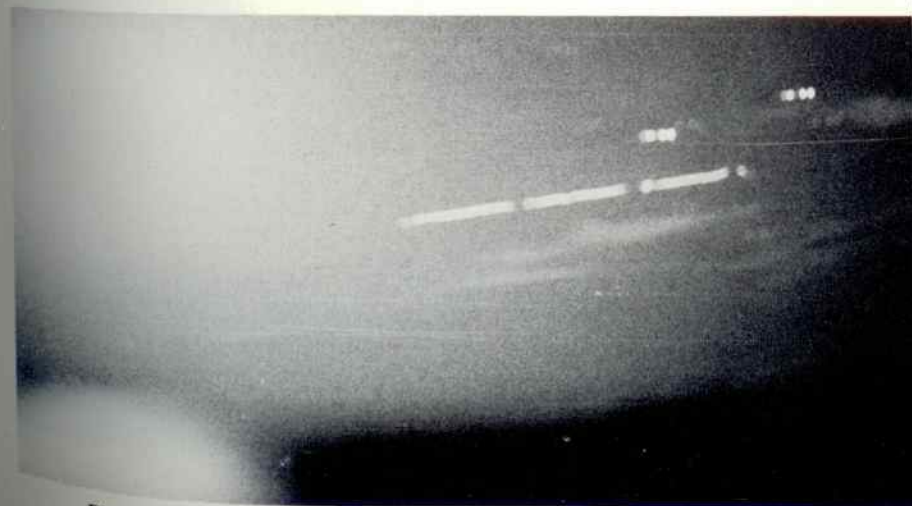


Plate 20. The lighted object had just passed the moon, appearing to speed up and rise. The lens was open for 10 seconds, then masked for 1 second in sequence. Film: Kodak Tri-X, ASA 800. Lens: 50 mm, $f/1.4$. (Author)



Plate 21. Following the exposure of Plate 20, the light was in and out of clouds on its way into a thunderstorm. Note lightning. (Author)



Plate 22. A 0.1-second exposure moving object, showing fore and aft equal brightness. The calculated speed 10 feet. $M = 7$. Film: GAF 500 (colliford HP-5). Lens: 800 mm, $f/8$. (W)



Plate 23. A 5-minute exposure taken direction of the Big Dipper from a road Chaffee. The light near the Dipper was not seen. Film: Kodak 2475, ASA Lens: 23 mm, $f/3.5$. (Author)



Plate 24. A second exposure of 12 mi in the direction of the Big Dipper. See 23. The light appears to have moved away.



Plate 25. A 1-minute exposure of a light that Maude Jefferis called "Grandpa." Film: Royal X Pan, ASA 1200. Lens: Optar 135 mm, f/4.7. (By permission of Maude Jefferis)

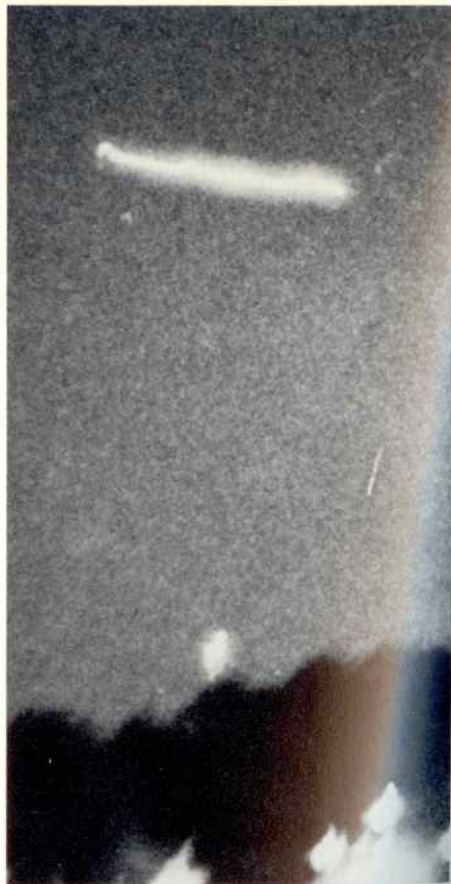


Plate 26. Time exposure of a pseudostar that moved from a hover position near the star Capella to the left toward Jackson, Mo. Film: Kodak Ektachrome, ASA 160 pushed to ASA 400 (copied on Ilford HP-5 film). Lens: 50 mm, f/1.4 (Author)

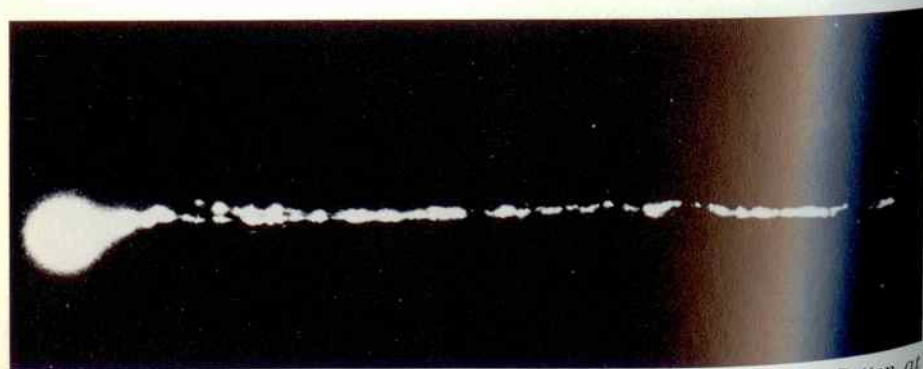


Plate 27. Time exposure of approximately 2 minutes, taken by Gary Sutton at Millers High Point, Piedmont, Mo., on March 27, 1973, using a Petri 35-mm camera loaded with infrared-sensitive film and a lens of 400 mm focal length. (By permission of Maude Jefferis; Gary Sutton)

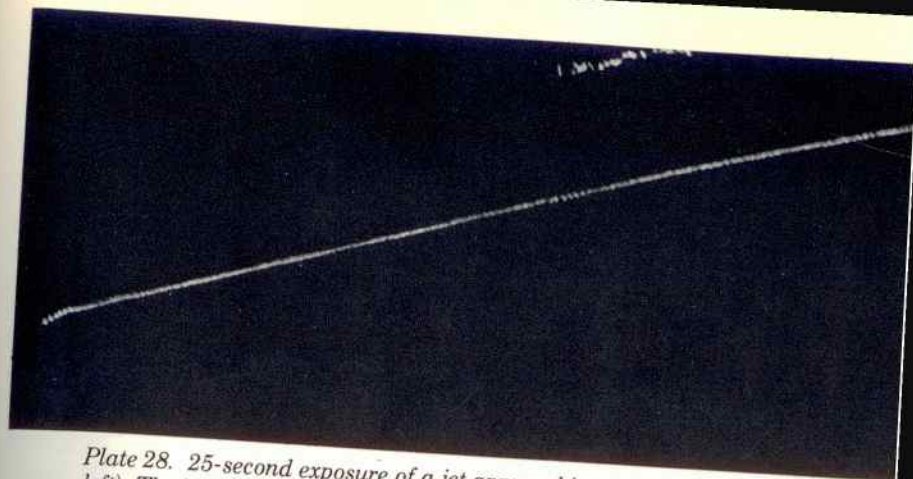


Plate 28. 25-second exposure of a jet approaching from the south (motion: right to left). The jet has brightened in the southwest and appears to be hovering. Note extra light that has been turned on. Film: Kodak 2475, ASA 6400. Lens: 800 mm with 2X extender. (Author)

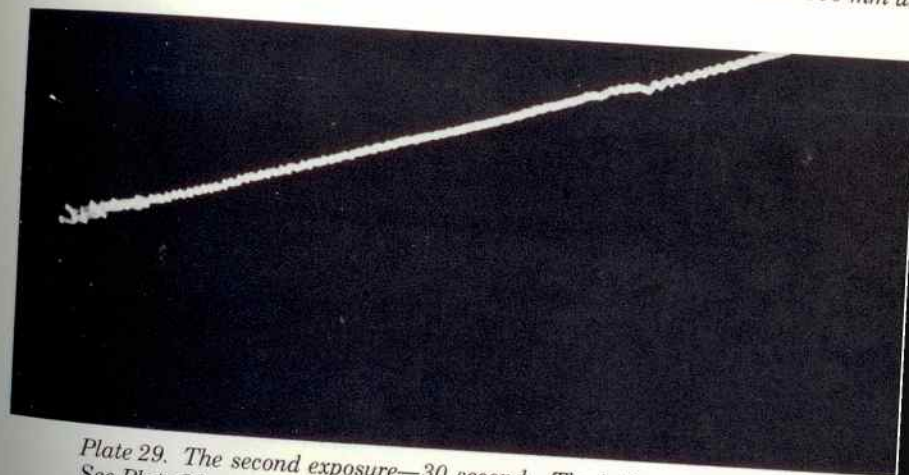


Plate 29. The second exposure—30 seconds. The jet is southwest of our position. See Plate 28.

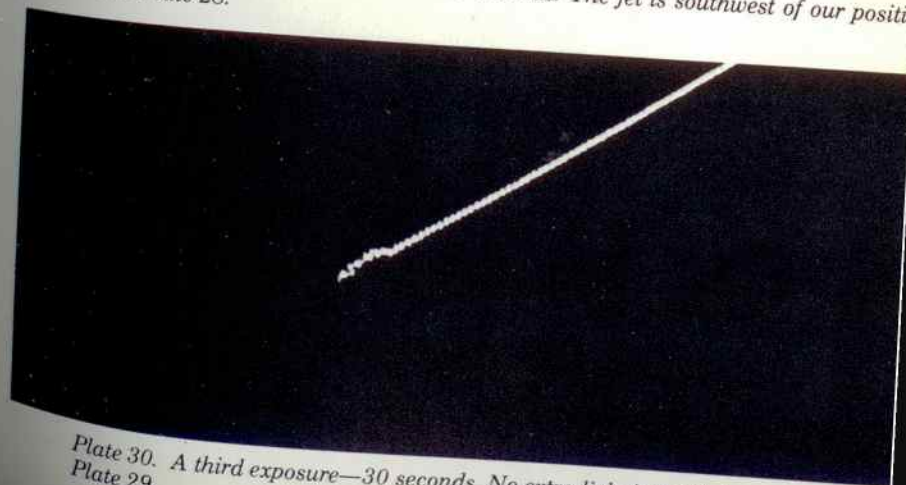


Plate 30. A third exposure—30 seconds. No extra light is visible in this plate nor in Plate 29.



Plate 31. 10-minute exposure of Vega and the constellation Cygnus. Film: Kodak Tri-X, ASA 400. Lens: 50 mm, f/1.4. (Author)



Plate 32. A second 10-minute exposure of the same view as for Plate 31.



Plate 33. The third 10-minute exposure of the same view. A dim light appears in about the same position as the hovering light seen there more than 30 minutes before. Note that the light does not trail, as do the stars, but may be motionless.



Plate 34. Exposure made during a field setup at Elsberry, about 30 miles northwest of St. Louis on July 3, 1978. From left to right, Mark Rutledge, Bob Adams, Jim Hickam. (Author)



Plate 35. I tighten a guy wire while Mark watches. The biconical antenna connects to a spectrum analyzer. Other detectors on the roof are a Geiger counter tube, radio antenna, and magnetometer pickup coil. (By permission of St. Louis Post-Dispatch; Gene Pospeshil)

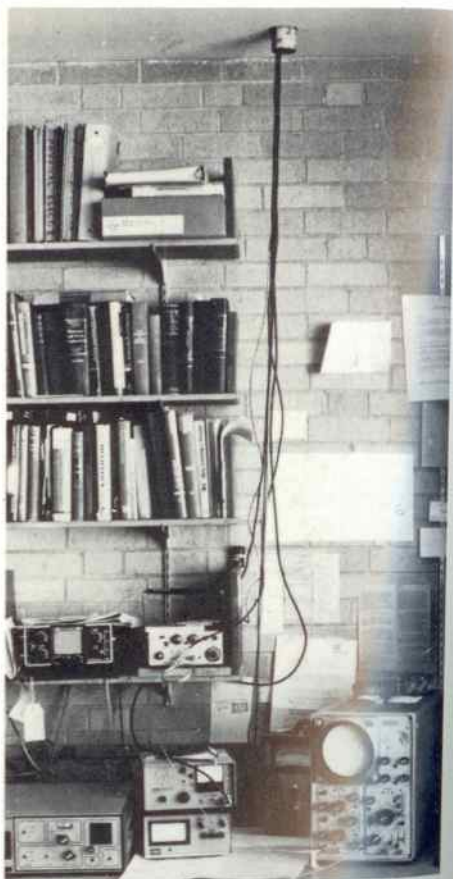


Plate 36. Cables lead down through a hole in the roof to signal processors in my office below. (Author)

At 11:15, I observed an orange light in the northeast, going north. Before I could make an exposure, the light passed behind some trees. Later, a pulse of light, lasting about one second, appeared in the container portion of the Dipper, close to the pointer stars. It appeared to be moving toward the North Star.

Although I was set up in the front yard on the night of July 9, nothing unusual was seen. But the next night was quite different. About 10:45, I looked overhead and saw a light traveling north-northeast. I rushed fifteen feet to the equipment in the darkness, knocking the tape recorder off a chair to the ground. As I whipped the long lens around and up, the light went out. Coincidence?

Three minutes later, a jet followed the same path as the light, apparently at the same altitude. But was it a jet? It sounded like a jet. But when I put the binoculars to my eyes, tilted my head as far back as possible, and centered the jet in my view, it did not look like any jet I had ever seen (Fig. 12.5). The wings' leading and trailing edges were serrated, like a saw blade. Maybe the Air Force has a new wing design, I thought. But it didn't make sense that the light was unevenly distributed over the entire undersurface of the craft in a "quilt-like fashion." Earlier, Linda Martin, a high school senior at Piedmont, had used the term to describe her sighting, in late March, of a relatively large, bright red object that hovered over the parking lot of the Clark Mountain Nursing Home, where she worked.

Later in the evening, I saw a one-second pulse of light in the container portion of the Big Dipper. This pulse did not appear to be in motion.

From July 11 to July 17, we had two Class B sightings. Then, we decided to check out Piedmont again. On Friday, July 20, Bob put a large camper on his three-quarter-ton blue pickup. After loading it with canned goods and other supplies, we picked up John and headed for Piedmont.

We didn't have any sightings on Friday night while set up in a pasture at the Toney residence. But we had learned never to set up a viewing station near a herd of cattle. During the summer of 1973, a wave of cattle rustling spread throughout Missouri, causing farmers to be wary. Lights had been reported above cattle herds at night. The

prohibited. Acceleration is inversely proportional to the time required for a change of speed to happen (F varies as $1/t$). Hence, if the time t during the acceleration is zero, an infinite force is required—again, a physical impossibility. (For a few semesters, when Newton's Laws of Motion were the topic, I placed my hand behind my back, crossed my fingers, and smiled a little.)

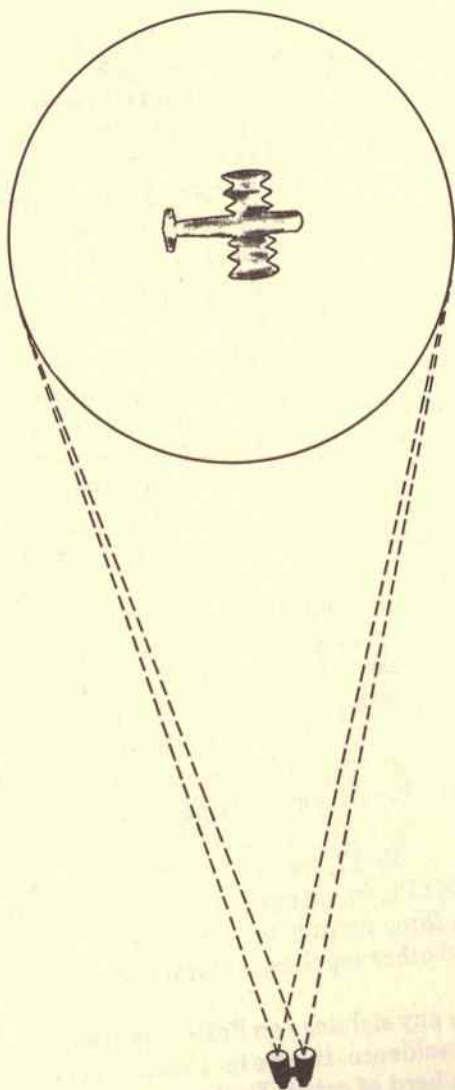


Fig. 12-5 Binocular view of a "jet" that passed directly overhead making a jet sound. The wing edges were serrated, and the light was distributed unevenly over the undersurface

prevailing explanation was that these were the lights on helicopters. While set up along roadsides, we were more concerned about people who came by, drinking or looking for trouble. Usually, however, we made new friends by showing people the delights of the night sky through a telescope. Bob was a master at that sort of thing.

On Saturday night we went to the fire tower on Mudlick Mountain, where we set up equipment on the three top levels. At 9:26, we saw a light in the west, heading south. Three minutes later, when well south of us, it brightened and went out—a Class B sighting. About 10:00, a light pulsed in the container portion of the Dipper—like my sighting from the front yard on July 8. At 10:31, and again at 10:40, bright moving lights were observed, which we identified as military or commercial aircraft. At 12:15, we had a fourth sighting, but labeled it a probable aircraft. At 3:00 A.M., we retired to the camper parked below, but the restless Bob was back on the tower at 4:00. He saw unidentified lights, Skylab, and the star Capella, which scintillated so brightly that he would have mistaken it for a UFO had he not been an experienced observer.

Set up in my front yard on the nights of July 22 and 23, I saw no UFOs. But on Thursday night, July 26, my luck was better. Soon after dark, an amber light approached directly on line with my location from a ridge to the northeast. I immediately cocked the camera in anticipation of a number of close exposures. It never happened. As if on cue, the light instantly reversed direction. Before I could get an exposure, it disappeared over the ridge.

Once again, about an hour later, the exact process was repeated. The amber light retreated as I cocked the camera. Was it a coincidence that each light reversed direction as I cocked the camera? Was it a coincidence that it happened twice in one night? Was there a reaction to me in each case? I was tempted to label both sightings Class A rather than Class B because of the quick reverse in direction of each light.

On Saturday, July 28, Debbie Scherer and two other witnesses were riding in a car north of Cape near Trail of Tears State Park. They had a daylight sighting of a stationary object with no wings. Debbie told me, "It was oblong shaped, and light in color with a dark area at one end."

On July 29, Bob, Ken Aldrich, and I went north of Cape, where we set up in the yard of David Aubuchon's rural home. We logged one Class B sighting, a light moving northeast. It went out as if switched off, eliminating a satellite as an explanation. By this time, because of

Bob's tutelage, my son Mark had become quite interested in astronomy and took some excellent photographs of several constellations. The sky was very dark and the city lights of Cape were in the distance.

July had been a reasonably productive month, with fifteen sightings; four of them were Class A. I wondered if we would do as well in August.

NOTES

1. Charles J. Oswald, "UFOs Are For Real," *St. Louis Globe-Democrat*, June 16-17, 1973, Section B.
2. "'Hubcap,' 'Bullet' in California," *The APRO Bulletin*, Vol. 27, No. 12 (June 1979), p. 1.
3. U.S. Congress, Committee on Science and Astronautics, *Hearings, Symposium on Unidentified Flying Objects*, 90th Congress, 2nd Session, 29 July 1968, p. 69. Hereafter, I refer to this as *Hearings*. The transcript of the hearings is included without material submitted for the record in John Fuller, *Aliens in the Skies* (New York: Berkley Medallion, 1969).
The UFO Evidence (Unidentified Flying Objects), National Investigations Committee on Aerial Phenomena (NICAP), Washington, D.C., 1964, pp. 84, 124.
 Ralph and Judy Blum, *Beyond Earth: Man's Contact with UFOs* (New York: Bantam Books, 1974), p. 188.
 Paris Flammonde, *The Age of Flying Saucers* (New York: Hawthorn Books, Inc., 1971), p. 24.
4. *The UFO Evidence*, p. 123.
 Flammonde, *Flying Saucers*, p. 32.
5. *Hearings*, p. 43.
6. *Hearings*, p. 58.
7. Richard F. Haines, "Psychological and Biological Aspects of Viewing Very Bright Objects," *UFO Conference*, Center for UFO Studies, Lincolnwood, Ill., April 30-May 2, 1976, p. 1.
8. Philip J. Klass, *UFOs Identified* (New York: Random House, 1968).

13

THE UFO ACTIVITY INCREASES

Judging from the many reports that I received in early August, UFO activity in southeast Missouri was on the increase. At this juncture, we planned to continue field observations until the UFOs left the area. None of us expected the UFOs to stay around permanently.

Among the interesting reports I received was one from Gale O'Neil of Irondale, who experienced a television blackout similar to those reported in Piedmont during the spring. On July 29, while he was watching the ten o'clock news, the picture turned to "snow" and the sound faded away. He went outside, where he observed a silent starlike object passing overhead. A minute later, he returned to the TV set, which now functioned normally.

At 8:40 P.M., on August 3, Ralph R. Mouser, Sheriff of Stoddard County, was driving south on Route 114, two miles south of Essex, Missouri. Mouser reported a cigar-shaped craft over some trees about a quarter of a mile away. The object, moving about 100 miles per hour, had three red lights on it and one smaller white light. Mouser stopped his car and turned off the engine, but could hear no sound from the object.

On August 5, Bob Krone, an agent with Northwestern Mutual Life Insurance Company, was enjoying a summer evening viewing the stars when he saw a brilliant blue-white light approaching Cape Girardeau from the southwest. He thought that it must be a satellite until it stopped, hovered over the city for about thirty seconds, and "shot upward at what appeared to be a steep angle."

On August 8, a Sikeston auxiliary policeman and his wife

were walking their dog near their home in Advance. They reported seeing an object moving north "at a pretty high rate of speed, having two large red headlights, like on a car." They observed it for five minutes.

Several other sightings were reported to me, but these examples suffice to show that the UFOs were still being observed by many persons in the area.

About 10:30 on Friday evening, August 10, my doorbell rang. Because we hadn't been in the field since July 29, I was surprised to see John Wilson, obviously excited. After I invited him in, he told me that while shopping on Main Street, which parallels the Mississippi River, he had decided to walk the short distance down to the riverfront. Immediately, his attention was drawn downstream, across the river, past the Illinois end of the bridge. There, he saw a hovering object with sequential flashing red, white, and green lights. From his position, the object was less than a mile away. Then the object began to move upriver until it met two similar objects flying south, this taking place directly across the river from John. He thought that he heard an engine sound.

He immediately started for my home on the north side of the city. About halfway there, he observed a craft overhead that was identical to the other three objects he had seen.

After John concluded his story, I telephoned the Flight Service Station, where I learned that four U.S. Army helicopters had departed Municipal Airport at 9:30, headed toward their base at Fort Campbell, Kentucky. The next day, a pilot friend of mine corroborated the information. He had seen the helicopters leave the airport and head for Kentucky. I tried to persuade John that he must have seen Army helicopters. But John's sightings had occurred over the river at 10:00—thirty minutes after the helicopters left the airport. John was sure of his time because he had checked it. "They sure didn't look like helicopters to me," he said. "I saw them across the river about one-fourth mile away."

In 1980, I queried Colonel Willard Bean, state aviation officer, Adjutant General's Office, Missouri National Guard, Jefferson City, about John's sighting of the helicopters. Colonel Bean said that he was of the opinion that the helicopters would not "play around for a half-hour." The air distance from Cape Girardeau to Fort Campbell is about 100 nautical miles (1 nautical mile equals 1.15 statute miles.) The helicopters at Fort Campbell were the UH-1 and OH-58 types, each turbine powered, each with a cruise speed of about 90–100 knots (nautical miles per hour), with a maximum speed of 120 knots, and each with enough fuel capacity for two hours

of flight plus a reserve of 0.5 hour. He said that all helicopters have rotating red beacons with white lights on the tail.

A belated inquiry to Headquarters, 101st Combat Aviation Group at Fort Campbell was fruitless. According to Specialist Four Gary Sikma of the Headquarters Unit, Army flight records are destroyed after 90 days unless there is an incident or mishap. Sikma interviewed various veteran helicopter pilots, but none could recall the flight over Cape. Sikma said that "no substantial or conclusive evidence can be derived from my research."

Whether John had seen helicopters or not, he and I packed some photographic equipment into the car and headed for the Illinois side of the river. By 11:00 we were set up on a side road southeast of the bridge.

All aircraft passing within range of our vision were easily identifiable. In fact, there was nothing unusual about the aircraft approaching our position at 1:00 A.M. With the naked eye, I could see the shape of the aircraft high to the east, and I could hear the sound of its piston engine. Particularly, I noted the white rotating anti-collision light. Nothing unusual yet; just a routine check—until I put the binoculars to my eyes. To my consternation, the anticollision light was no longer a rotating beacon, but had become a xenon-type strobe light of exceedingly short flash duration. If that wasn't enough to assault my senses, the strobe light was jumping around in my binocular field like the phenomenon I had observed on the night of May 24 at Fredericktown. John confirmed my description through his binoculars. Although I took several exposures of the receding JSLX, the flashes were not bright enough to register. No images showed up on the developed film.

During the entire observation, I was looking through glass. At first, when the anticollision light appeared to be a rotating beacon, I was wearing spectacles. To look through the binoculars, I removed my spectacles—a procedure I followed throughout the Project study. Although the repetition rate, the number of flashes per second, was the same for the spectacle view as for the binocular view, the flash duration decreased dramatically in going from corrective-lenses view to binocular view. There is no physical reason for this. The only acceptable explanation is that the pilot turned off the rotating beacon and turned on a xenon strobe light at the moment I put the binoculars to my eyes—a very unlikely coincidence. Then, of course, there is the matter of the jumping strobe light.

We set up at the location the next night, but saw no UFOs.

The next week I received a report from Beth White of Sikeston. She described a light that hovered nightly in the same

location. Usually the stimulus for this type of report is a scintillating star, one that appears to flash red, white, and green light. But her description was so vivid that we decided to check it out.

On the night of Tuesday, August 21, Ken, Bob, John, and I went to Sikeston to Beth White's residence. She took us to the back yard, where she pointed at the light described in her report. We immediately recognized the bright star Antares in the constellation Scorpio. Antares was scintillating, or "cutting up," as we sometimes called it. We explained the phenomenon to her.

Since we were in Sikeston, we decided to find a viewing location. We found a side street in a subdivision in southwest Sikeston earmarked for construction. The view was good except to the north and east, in the direction of the city lights.

During the next couple of hours, we observed two or three amber lights, but did not label them as UFOs. At 12:06, Ken spotted a dim light in the constellation Cassiopeia to the northeast. Until we observed it in binoculars, we didn't detect its motion. We could not identify the slow-moving light even on the 80X setting of the Questar telescope. It remained visible in the telescope, haze and all, until 12:24. We didn't call this a UFO either, although it certainly aroused our curiosity.

At 1:18, John spotted a southbound light in the northwest. To Bob, looking through the Questar telescope, it appeared to have two white lights, one fore and one aft, with a red light underneath. Within seconds, we noticed a second light in the southwest, going north. The two lights appeared to be on a collision course. As they closed the distance between them, John shouted, "They're going to meet! They're going to meet!" John, standing next to me, was operating the 800-mm lens camera system, while I had the 500-mm system.

When the two lights entered our fields of view, we began our time exposures. The two lights met perfectly on line. Then, the light going south dimmed while the one going north brightened. Ken observed the southbound light until it disappeared in the distance. On the northbound configuration, Bob observed two flashing red lights and two steady white lights, one each of the latter, fore and aft. The white light in back went out for two minutes. By 1:28, the object was out of sight.

On the slide exposures that John and I made, there is no evidence that two lighted objects met. All we have are single trails; yet, John and I each made an exposure while the lights were meeting. The meeting of the objects is slightly unusual, but neither unworldly or incredible. If the objects were very close and on line with the cameras when they met, it is possible that their paths are

superimposed on film. Nevertheless, by our criteria, we counted one sighting of two UFOs.

We didn't go into the field the rest of the week, but on Saturday night, several of us gathered at the Adams observatory. Although we were there to look for UFOs, we observed several astronomical objects through the observatory's telescopes, one with a mirror 10 inches in diameter and one with a 12.5-inch mirror.

At 12:02, I asked Bob, "What is the name of that star high to the east?"

He pondered a moment and said, "I don't know, I don't recognize it. I'll have to look it up in the star atlas . . . hey, that's no star! It's moving!"

In movement and direction of motion, the light resembled the one we had seen at Sikeston on Tuesday night. This light looked more the color of a satellite, although the other one at Sikeston had been observed through haze at a much lower angular altitude. I photographed the light with the 800-mm lens camera system, while John and Bob rushed inside the observatory where they observed the light through the ten-inch telescope.

Even on 150X, the light had no structure. They timed the transit of the light across the known angular field of the telescope. Using this angular speed and requested data sent to me by a scientist at the Space Sciences Research Center at the University of Missouri at Rolla, I concluded that the slow-moving light was a satellite in polar orbit by the name of Pageos A. The time of appearance on both Tuesday and Saturday nights agreed with the satellite's predicted appearance. Being a high-altitude satellite (varying from 2,300 to 2,800 miles) and in polar orbit, Pageos A may be seen at almost any hour of the night—the satellite can be eclipsed by the earth—unlike low satellites which are approximately 200 miles high. Those in a west-to-east (nearly equatorial) orbit fade out as they enter the earth's shadow, and are seen only during the early evening or predawn hours.

The scientist wrote that there were 2,500 objects in orbit, of which about 10 are visible to the naked eye at various times. (As of June 1980 by contrast, there were about 4,555 man-made objects in orbit. Each month the Soviet Union and the United States add about six each.¹) These included Pageos A, two Pegasus meteoroid detector satellites, the Orbiting Astronomical Observatory (OAO) satellites, and a Russian space station. To this list we added Skylab.

Two sightings occurred in August for which the dates were not recorded. One involved what I call an *accidental* sighting—which occurred when we were not set up; not on watch. In this case, I went

outside into the front yard after dark. There, at an angular elevation of about 45° in the southwest, I saw a "star" circling another, real star. After making more than one complete circle, the light went out. The star that was circled was at the exact center of the circle described by the moving light. I labeled the sighting Class B. The next sighting reported here was certainly not a Class B.

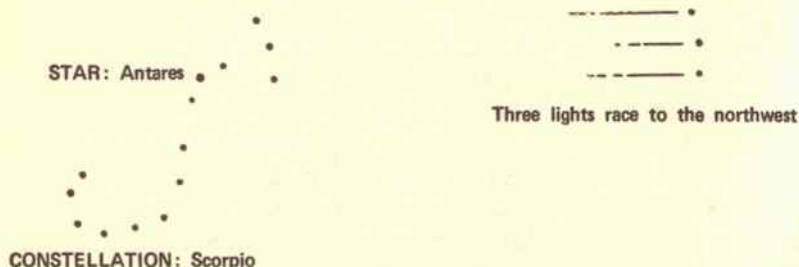


Fig. 13-1 Three lights at dusk appeared to be three stars that had come out of the constellation Scorpio

At the time, I was set up in my front yard, alone. The family had gone on some errand, probably grocery shopping. The stars were out. Twilight faded into dusk. To relieve my boredom, as I watched, I walked the 25 feet from the setup to the street. I could, with difficulty, read the license plate on the car parked in the drive across the street. Looking down the street to the southwest, I saw three off-color white lights moving at moderate speed to the northwest (Fig. 13.1). Stacked in a vertical line, the middle light was closer to the lower light and forged ahead of the other two. During the five seconds I watched, it looked like a race. I ran to the 800-mm lens camera system, mounted on a D & S tripod, and whipped the long lens around to point southwest. The three lights were gone—vanished!

An odd feeling came over me. The three lights had been on direct line with the three stars in the upper right portion of the constellation Scorpio. The three lights, it seemed, had come out of Scorpio. Quickly, I checked Scorpio to the south-southwest. All the stars of the constellation were there, in place. Perhaps, I thought, the three lights may have been aligned with the three stars in Scorpio before moving. I'll probably never know.

Ufologists place great emphasis on radar-visual sightings, because the UFO can be seen as well as detected by an instrument. On the night of September 4, Drake Kambitch had a radar-visual sighting while piloting a Cessna 337 to Los Angeles on a contract

basis for the owner of a local trucking firm, Jerry Lipps. Lipps was riding copilot, but could not confirm the sighting. Drake gave me this account:

"We were flying west at 1,400 feet MSL [mean sea level] between Phoenix, Arizona, and Los Angeles in the mountains approximately 9:00 P.M., WDST. My heading was 270° at 196 miles per hour. Soon I observed a white light ahead of us. It moved to the left, then back in front again. It was the same color as those lights we saw at Piedmont. The brightness of the light was the same as that of an aircraft landing light at that distance."

Los Angeles Center radioed Drake: "Skymaster one-seven-seven-zero-M, traffic twelve o'clock, four miles ahead, eastbound, slow."

"Seven-zero-M looking for traffic," Drake replied. He could see nothing ahead except the light. A few moments later, the Center called again: "Seven-zero-M, traffic no factor. He must be low and dropped behind the terrain. Lost radar contact."

"Seven-zero-M, roger," Drake responded. But Drake could still see the light, whose position had not changed relative to the Cessna 337. The light maintained a constant distance of four miles ahead of the aircraft for some time. Drake didn't inform Lipps of the sighting, because he didn't want to create any excitement before coming into the airport at Los Angeles.

By late summer, the Piedmont flap had spread to a large portion of Missouri, then nationwide. I wasn't too surprised when a UFO flap broke out in the Tennessee-Georgia area in early September.² One night in late August, while we were set up, a dozen or so white lights passed over during the evening, all headed southeast. Because of the large number of lights, I figured they were not satellites. But because the high-flying lights did nothing unusual, we didn't count them as UFOs. Because we were having fewer sightings than usual, I predicted that the UFOs would show up in the southeastern United States.

During most of September, I observed from the front yard, although a few field trips were made to the vicinities of Chaffee, Oran, and Delta. Classes were in session again at the University, and I had little time available for field study.

At 8:08 P.M., on September 23, I observed from my yard a light come from the direction of the Big Dipper. It was flashing at least twice per second in equal time intervals. Because it was passing directly overhead and because it was moving so fast, I was unable to get an exposure. In fact, my estimate of the transit time was between 10 and 20 seconds. It disappeared into the eastern haze. Although

not as bright as the star Vega, it was brighter than most of the other stars. Although I heard no sound, I did not count it as a UFO.

One evening in September, my wife and son were riding with me in the front seat. We were going east on Bertling Street. Just before I turned right on Sprigg Street, I saw a bright light high to the east, about 10° to the right. I asked Mark what planet could possibly be in that position. He knew as well as I that no planet belonged there. While turning the corner, we lost sight of the hovering light. When I looked again, it was gone.

Others who live in Cape Girardeau have told me of similar experiences. The wife of a prominent physician was driving to Southeast Missouri Hospital one night with the wives of three other physicians. She told me that they saw a light hovering over the hospital. Then, it "shot straight up," out of sight.

The August-September period was not particularly productive with regard to sightings by Project members. We had five sightings (eight UFOs) in August and three in September, much less than the fifteen sightings in July. Perhaps the UFO flap in southeast Missouri was finally ending.

But the UFOs didn't leave southeast Missouri in October. Quite the contrary, the new month began with an immediate increase in UFO activity, correlating with a nationwide flap that started in September.

NOTES

1. Thomas O'Hanlon, "Lost in Space," *Omni* (June 1980), p. 35.
2. *Johnson City Press-Chronicle* (Tenn.), September 2, 1973.
Herald-Whig (Quincy, Ill.), September 4, 1973.
The Rocky Mountain News (Denver, Colo.), September 4, 1973.
Washington Star-News (Washington, D.C.), September 4, 1973, p. A-3.
Orange County Register (Calif.), September 5, 1973.

14

PHYSICAL EVIDENCE?

On the morning of October 2, 1973, I received a telephone call from newsman Mike Shain, at KFVS-TV in Cape, informing me of a teletype message at the newsroom concerning a sighting the previous night at Sikeston. I picked up the teletype copy, which read:

Z. T. JACKSON, 707 EAST KATHLEEN, SIKESTON, 41702830. MR. JACKSON AND HIS WIFE WERE DRIVING ON NORTH INGRAM ROAD ABOUT THREE MILES NORTH OF SIKESTON YESTERDAY EVENING WHEN THEY SAW SEVERAL LIGHTS MOVING RAPIDLY AND ERRATICALLY. THEY STOPPED, TURNED OFF CAR LIGHTS AND GOT OUT TO LOOK AT LIGHTS. SUDDENLY AN OBJECT ROSE FROM A NEARBY SOYBEAN FIELD TO A HEIGHT OF A HUNDRED FEET, GLOWED RED AND THEN VERY BRIGHT RED. HE TURNED CAR LIGHTS ON IT AND IT ROSE QUICKLY TO SEVERAL HUNDRED FEET AND HOVERED BRIEFLY AND THEN LEFT AT HIGH SPEED TOWARD THE NORTH. FIRST LOOKED BULLET SHAPED BUT AS IT GOT REDDER, SEEMED TO BE ROUND, 50 FEET IN DIAMETER. SILENT. NO NOISE, NUMEROUS OTHER SIGHTINGS OF TWO OR THREE LIGHTS MOVING RAPIDLY AND ERRATICALLY. POLICE HAVE BEEN GETTING CALLS FOR A WEEK OR SO AND SOME OFFICERS HAVE SEEN THEM SIKESTON NORTH TO CAPE.

After lunch, Bob Adams and I went to Sikeston, where we met Jackson at the Ramada Inn just off I-55. Jackson was a special

officer with the Sikeston police force. Detective Lieutenant Dan Hinton and Sergeant Jack C. Patterson were there too. After introductions, we taped Jackson's account of the sighting. Then Lieutenant Hinton went on to describe sightings he and other police officers had seen during the summer. A few sounded to me like descriptions of scintillating stars, but in one account, a Sikeston police car had been followed by an amber light while returning from Charleston. The UFO could not have been a star.

After our conference, Bob and I followed Jackson to the farm about three miles north of Sikeston where the event had occurred. A large German shepherd dog awaited us in the driveway. We did not get out of the car until the dog's owner, Harold Rettig, came over. After some discussion, he took us to the edge of a soybean field west of the barn. We drove along a lane through the middle of the field.

The land was flat, for this was Mississippi River floodplain. The soybeans on each side were knee high. We stopped near the location where the red light had been spotted. With a portable Geiger counter, I checked the clothes Jackson had worn the night before. There was no unusual level of radiation. Next, I took samples of soil and soybean leaves from a circle about twelve feet in diameter. Jackson said the object had been directly over the circle. To me, the circle was not well defined and it looked as if the soybeans in that area were deficient in their growth and therefore a different shade of green. Certainly, none of the plants had been bent or broken, and the soil had not been disturbed.

After the red light had left, Jackson had walked into the soybean field, using a flashlight. He said that the bean leaves in the circle were wet, while those outside the circle were dry. As a control, I took samples of soil and bean leaves from well outside the circular area. As we left, I paced the distance from the circle to the road—about 100 yards. Then Bob and I left for Cape.

At the University, the samples I had taken from the circular area were subjected to fluorescent X-ray analysis to determine what chemical elements were present. But for both the soil samples and for the leaf samples, the spectra on the oscilloscope screen matched those of control samples taken from outside this area. At the time, we did not have more sophisticated equipment to make additional tests. Chemical tests, using atomic absorption flame spectrophotometry, would have been arduous and time consuming. In my opinion, the craft/light had not set down on the soybeans and left any physical evidence. Jackson himself was not sure that it had set down; it may have only hovered above the beans instead.

Because of what the police officers told me at the Ramada Inn, I decided to return to the beanfield that night to set up a viewing station. Besides, a setup at Sikeston would be good public relations for our Project and for the University.

When I got home, I telephoned several Project members. For once, even reliable Bob couldn't go. In desperation, I asked my wife to go along. She agreed. When we arrived at the Rettig farm, the faithful German shepherd was there to greet us. As a precaution, I pulled my arm back through the window. Rettig came out of the house, quieted the dog, and told me to drive into the soybean field, where he would join us later.

We drove down the lane about halfway to the end of the field, which was bounded on the west by a line of closely spaced trees. I didn't want to get so close to the treeline that our view would be greatly restricted. While I was mounting the 800-mm lens camera system on the D & S tripod, Officer Jackson and his wife joined us. We had not planned this meeting in the field, but they too had brought coffee and cookies. The women passed the time in conversation. Rettig, his young son, and the German shepherd arrived before dark. The dog really was quite friendly.

My first entry on tape at 8:15 P.M., CDT, describes the equipment and the sky conditions. Mars and Jupiter were visible. The moon, in its first quarter, was so bright that we could see our shadows. Ten degrees left of west was a vertical line of red lights on a microwave tower.

At 9:04, we saw a bright light in the west, to the right of the tower, headed northwest. In 12 seconds, it crossed my binocular view of 7° , an angular speed of $0.58^\circ/\text{S}$. At 9:05, near the end star of the Big Dipper handle, it went out. It did appear again in a couple of seconds. Because there were clouds in the sky during the evening, I cannot say definitely that clouds did not obscure the light. Perhaps the suddenness with which it went out influenced me to count it as a Class B sighting. We did identify several aircraft; possibly several pilots were flying in search of UFOs, because the police officer's story had been publicized in Sikeston too.

By 9:55, the western sky was clear. The moon was 5° above the horizon, about to set. We picked up an orange light in the west, going north. Suddenly, as we watched, it went out—another Class B sighting.

At 10:45, we saw another light in the west. When I looked at it through binoculars, however, this was not just another light! It was square, like a window. The color was yellow-to-amber, like the color

of the flame of a kerosene lamp, a candle, or a match. After three or four seconds, two additional "windows" appeared, one on each side of the original "window." In less than five seconds, the two "windows" went out, then came on again a few seconds later.

The configuration seemed to be approaching as I viewed it through binoculars. I had seen enough; trying to get an exposure, I cocked the camera. At that instant, all three "windows" went out, as though switched off. There I stood with cocked camera—and nothing to photograph. It seemed a bit unfair not to give me at least one exposure. Was this a reaction to me, I asked myself, or just another coincidence?

At 10:54, an amber light in the west, much farther away than the "windows" had been, went on and off a few times—a sighting that I labeled Class B.

At 11:02, the police dog became alert. His ears stood erect, and the fur ruffled his back. Suddenly, his demeanor changed to one of fear. He ran to Rettig, cowered, then burrowed between the man's legs. Rettig said he had never seen the dog act afraid. Surely, the fear shown by the big German shepherd was not caused by something hiding in the knee-high soybeans, which were below the height of the dog. Instinctively, I looked straight up, and for an instant, I thought that I saw a dark form. A chill went down my back. Although the entire episode hadn't lasted more than a minute or so, a definite uneasiness pervaded our group.

Later, I asked my wife to describe her perception of the "window" sighting. She said that she had discerned the windows with her naked eye, and added something else that intrigued me. She said that when the dog became afraid, she felt as if some invisible object were flying overhead. (She had never read a book on UFOs and had little real interest in them.) She too thought that she had perceived a dark form overhead. Although our perceptions agreed, as a scientist I had to discard them.

Instead of returning home by I-55, I chose the older, more circuitous, and relatively unused Route 61, which winds through wooded hills. I had received reports that lighted objects had flown near automobiles in this area—sometimes frightening the occupants of the cars—and I was hoping that our car might attract an aerial object. Although I kept the camera ready, nothing happened during the drive home.

Six hours later, we learned of a truck driver who claimed to have been struck in the face by a ball of fire shot from a pursuing UFO! The alleged event took place on Wednesday morning, at about 6:30, on I-55, not more than three miles west of my home.¹ The truck

driver had just passed the Jackson exit when he looked in the rear view mirror and saw red and yellow glittering lights following about a mile behind. He mistook the lights for a flatbed trailer with its headlights off. After he woke up his wife, in the sleeper cab behind the front seats, she could not see the lights.

Just before the truck entered a patch of fog, the lights were close behind. The driver later described the object as turnip-shaped, about 30 feet in diameter, and nearly as wide as the concrete roadway. The bottom and top sections, looking like aluminum or chrome, were spinning, he said, but the center section, consisting of red and yellow lights which seemed to mix, was not spinning.

He stuck his head out of the cab to look back and saw a spotlight shining on his tandem of the trailer. Above the engine sound of the truck, he heard a humming sound, he said, which rose in frequency with the lights. Moments later, a "flash, like a ball of fire," hit him in the face. He withdrew his head and according to his wife, screamed, "I can't see! I can't see!" He slammed on the brakes and stopped the truck in the middle of the highway. His glasses, apparently melted from the fireball, had fallen off, one lens separating from the frames.

His wife drove the truck to their destination, the Sam Tanksley complex south of Cape off Highway 61 near the airport. An ambulance was summoned, and he was taken to Southeast Missouri Hospital. A local ophthalmologist examined him, but could find no evidence of blindness, burns, or other injuries to his eyes. The truck driver was released and returned with his wife to their home in Greenville, not far from Piedmont.

The next day, I learned of the episode when Sergeant Ed Wright of the Missouri Highway Patrol telephoned to inform me of the glasses, which I received later. During the afternoon, the glasses were examined and photographed under a microscope. A check for radioactivity gave a negative result.

Friday morning, I took the frames down the hall to the Law Enforcement Assistance Council laboratory. No unseen residue was found on the frames. Next, Dr. Donald Froemsdorf, an organic chemist, examined the frames, which were pitted by bubbles that had broken, and eliminated acid or typical flames as the cause of damage. "In my opinion," Froemsdorf said, "vapors from a volatile organic chemical could cause the same effect. These vapors could also cause skin burns and impairment of eyesight."

Saturday morning, I took the frames and lenses to the branch manager of the American Optical Company laboratories in Cape. He made various tests on other similar frames, but none of these yielded

similar damage patterns. He tested the glass lenses of the frames worn by the truck driver but could find no evidence of damage.

After he completed his tests, I went to the Tanksley complex to inspect the truck itself—which, unfortunately, had been dispatched to California. I questioned the night foreman who had been on duty when the driver and his wife had arrived on Wednesday morning. The foreman gave me a clue as to what could have happened, a hypothesis for me to test. He said that on Wednesday morning, one of the drivers for Tanksley saw the truck in question at a highway department rest stop fifteen miles north of Cape. Allegedly, the driver saw a road flare near the truck.

Next I drove to the rest stop to search for remains of a road flare, but found none. I showed the glasses frames to a truck driver at the rest stop and asked him how the damage could have been produced. His immediate response was: "Road flare!" He gave me the name and company of a truck driver from the St. Louis area, who also had seen a road flare at the rest stop early Wednesday morning.

On the way home, I purchased some road flares and held a hot flare within six inches of test frames similar in composition to the damaged frames. A considerable time of several seconds was required to cause bubbling of the plastic. No one could withstand such heat while wearing the frames—but the damage pattern on the test frames was similar to that of the frames worn by the truck driver.

In summary, the radiation that struck the truck driver in the face either had to be visible, or the pulse of radiation had to cause the air to become luminous in passing through it. The air could have been excited by microwaves or even certain types of nuclear radiation. On the other hand, microwave radiation in the vicinity of 2,450 MHz—a resonant frequency of the water molecule—could be eliminated: the bone, flesh, and especially the fluid substance in the eyeball would have been heated, while the plastic frames would have been unaffected by this radiation! As a check, I placed similar frames in a microwave oven. As I expected, no change in temperature of the plastic frames was detectable.

I had planned to send the truck driver's frames to a group in Columbia, Missouri, for tests using a nuclear reactor, but I decided to terminate the investigation and released a story stating that there was a possibility of a hoax.² In fairness to the truck driver, I had not proved that the incident did *not* happen.

Probably few persons know that the truck driver later filed for workmen's compensation and medical expenses.³ On February 24, 1975, Edward F. Raglin, Missouri Division of Workman's Compensation referee, ruled that the truck driver had been injured in an

accident while on the job. Attorneys for the insurance company argued that UFOs are "acts of God," and therefore the truck driver wasn't entitled to damages! Then Judge Raglin had a change of mind; in March, he set aside the ruling in the truck driver's favor and scheduled a hearing on the matter to consider all the issues.

I was visited by attorneys from both parties. I informed them that if called to testify, I would say that UFOs exist. I could see that the case could be of much greater importance than a simple appeal for compensation and medical expenses. The hearing would attract the media, and it seemed to me that I would be the key figure in proving that UFOs exist.

Fortunately, the parties settled out of court. I was relieved, partly because I realized that what is considered legal proof often differs considerably from what is considered scientific evidence. It did not appear likely that my participation in the trial would enhance my credibility in any way.

I have noticed that newspapers, magazines, and books that carried the original account of the truck driver incident did not include the follow-up story, in which the incident was labeled a possible hoax. One ufologist and prolific writer questioned my investigation by stating: "Like the Pascagoula story of robot-like monsters,* the facts were unbelievable to local scientists, who examined them out of context of the overall phenomenon."⁴ What facts?

I wasn't the only one to have a UFO sighting the night before the truck driver incident. A University student, Steve Palmer, and a girlfriend were parked after dark in the city park at Jackson. The car was facing east toward a grove of trees about 100 yards away. Suddenly, their attention was drawn to a disc-shaped object or light that rose silently from among the grove of trees, made a right-angle turn, and headed southeast. For an instant, Palmer thought that he must be seeing the reflection of a searchlight off the clouds, but there were no clouds and certainly no searchlights. The girl summarized the situation succinctly: "Let's get the hell out of here!"

The next night, Wednesday, October 3, the date of the truck driver incident, I was driving on Route 61 on my way to pick up Bob.

*Briefly, two men, Charles Hickson and Calvin Parker, were reported to have been fishing after dark from a pier on the Pascagoula River on October 11, when a craft approached their position and hovered. Three strange-looking creatures "floated" toward the two men, "floated" them back to the craft, gave Hickson a physical examination while Parker was unconscious from fright, and returned the two men to their position on the pier. The story was a major news item, of course.

As I was coming up the last hill past a row of business establishments, a bright white light crossed the road at the top of the hill. If it wasn't a UFO, it was rather daring to pass over the city at about 200 feet, in violation of an FAA flight regulation. It violated FAA regulations further, bearing no green navigation light, no rear position light, and no flashing anticollision light.

When I reached Bob's home, I described the Class B sighting to him. After loading his equipment in my car, we left for our familiar location on Nash Road. Bob was very proud of his new Criterion Dynamax 8 telescope with an eight-inch diameter mirror. The focal length of the telescope is 2110 millimeters (83.1 inches). We wished that the telescope had arrived months earlier. Using the excellent finder scope parallel to the axis of the main telescope, it was easy to aim. Certainly it would have helped in tracking a moving target.

At 8:50, I picked out a dim flashing light to the west—something I had seen before. The light was a jumping strobe, flashing once every second, and executing a rising staircase pattern. I made several exposures. Bob said that he didn't think that the light was jumping, but I could see it was—I was looking right down the barrel of the stable 800-mm lens. But on the developed negative, the light pattern did not show up. I was not surprised, since the maximum aperture for the lens was $f/8$.

A similar phenomenon had occurred the night before, while we were in Sikeston. At 7:30 P.M., Ron Lowes, a Cape Girardeau insurance salesman, was driving on Route 177 in the northeast part of the city when he saw a silvery object reflecting the sun's rays. On it were bright flashing red and green lights; so bright, in fact, that he could not make out the shape of the object, although he surmised that it was round. Most important, he told me that the flight of the object was erratic. Lowes, a 1965 graduate of the University and a former combat photographer with the Marine Air Wing in Viet Nam, told me, "I've flown in several types of aircraft, including the F-4 Phantom, but this was not any type of aircraft I've ever seen!"

Later Wednesday night after midnight, when Bob and I were ready to quit, we saw an orange light originate just east of the airport across I-55 and shoot away at tremendous speed. It appeared to travel a horizontal path at very low altitude; less than a mile high, maybe less than a half-mile high.

A day or two later, I accidentally met a man who had observed the light from his position in the northern portion of Cape, in the vicinity where the insurance salesman saw the erratic object. The man agreed with my estimate of the flight path. He described the light as a "blur." I recalled the night in May that Drake and John had

returned from Farmington in the Cessna 150 and saw an orange light on each side of the airport as they approached for a late-night landing.

Friday night, October 5, was memorable for the sheer number of observers and vehicles involved. Our crew consisted of nine persons in three vehicles bound for a farm near Millersville, about 20 miles west of Jackson. A nearby farmer, Ernie Seabaugh, had reported to Bob that lights had been hovering over his farm on a nightly basis.

Arriving after dark, we drove through gates to an open field. Three vehicles and a tractor pulled into position with headlights blazing. No wonder the UFOs avoided us that night! The briars didn't improve my disposition either—and I ruined the muffler on my car. Fortunately, Seabaugh had an interesting story that I tape-recorded.

For more than a month, lights had been hovering over his farm, at an altitude he estimated to be 6,000 feet and near a jet airway (J-35), although a jet airway is from 18,000 feet up. The lights were white and would go out at times, Seabaugh said. They would also remain stationary, even on nights when the wind was blowing at 20 miles per hour or more. One night he observed blinking red lights and blinking white lights. One of the objects turned on a spotlight; then suddenly, all of the lights went out. He telephoned the sheriff's patrol at Jackson to report his observations. A spokesman told Seabaugh that someone at the Flight Service Station had said that the National Guard was holding training maneuvers.

The first few nights, Seabaugh perched on the roof of his barn with a high-powered rifle handy. He had heard that cattle were being rustled by persons using large cargo helicopters. One night, when he saw two lights approach each other, then execute fancy circles about each other in a vertical plane, he concluded that he was not watching helicopters. I wish he had taken his camera instead of his rifle up on the barn roof.

On Saturday night, I set up equipment in my front yard, but I didn't stay there long. At about 8:00 I received a telephone call from the FSS that a large crowd in Jackson was observing a UFO. It must be the real thing! I thought. Quickly, I put some equipment in my car. But when I arrived at the address given me in Jackson, no one was about. The street was deserted.

After ringing a few doorbells, I received an explanation. Earlier, about 30 persons had gathered to watch what one observer described as an "orange ball of fire" move across the sky from east to southwest. Fred Williams had seen it first and had notified the

FSS. As I talked to Williams, the mystery was solved. It was the planet Venus, seen for a time between two cloud layers low in the west. Through the haze, the planet had appeared as a red ball.⁶

I was beginning to develop an ambivalence toward investigating others' reports, and from that experience, I vowed never again to react so quickly to a UFO report. I would drive too fast, jeopardizing my life and the lives of others, and the probability of arriving on the scene during a sighting was minimal.

The next weekend, my parents visited from Council Bluffs, Iowa. I was hoping that my father would see a UFO during their visit, so on Saturday night, October 13, at my invitation, he went along on our second trip to the Seabaugh farm. I was disappointed that we saw no UFOs, even though six of us were observing.

For some reason, both the skeptics⁷ and the believers⁸ have stated publicly that the 1973 flap originated in Georgia in late August, and was beginning to ebb in October until the Pascagoula, Mississippi, incident on October 11.⁹

Then Ohio became the locale of UFO activity. Governor John J. Gilligan reported that he and his wife had observed a UFO on the night of October 15 while driving back from a weekend vacation in Michigan.¹⁰ The Ohio flap culminated on the night of October 18 when the crew of an Army reserve helicopter had a frightening encounter with a UFO.¹¹

Meanwhile, on the evening of Sunday, October 14, I stepped outside to check the dark sky from my front yard. It was 8:20, and a beautiful, clear fall sky showed its many stars. In the northeast, the star Capella danced brilliantly in red, white, and green. Approximately 10° right and 5° lower, a star of lesser brightness matched Capella in the beauty of its scintillations.

Not being able to identify the star, I went back inside, but the presence of the unidentified star bothered me. Thirty minutes later, I went outside again, taking my binoculars with me. First, I viewed the scintillating Capella. Nothing unusual there. Then I moved the binoculars down and to the right. Surprise! The red, white, and green scintillations weren't as random as they were for Capella, as they are for any real star. These were mechanically or electrically controlled: the flash durations, although only a fraction of a second, were equally spaced. They were not of natural origin. As soon as I realized that it was a pseudostar, it began to move to the left, toward Jackson. Was this a reaction, I wondered, or just a coincidence?

Rushing into the house, I alerted everyone while I procured a D & S tripod, 35-mm camera, and the 800-mm lens. Usually I left the 800-mm lens camera system set up on the tripod in my office, where

I could move it to the yard in record time; scratches on our wall paneling attested to that, my wife said. But upon my hasty return to the front yard, I knew I had to hurry, for the light had almost pulled even with KFSV-TV tower six miles to the north-northeast. The light would pass between us and the tower. Finally, I realized I would not be able to put the system together in time.

As an alternative, I steadied the camera with 50-mm lens on the tripod, exposing the film as long as I dared in the light of the numerous mercury-vapor lamps to the north (Plate 26). By this time, the light had changed from orange to an off-color white. Soon the light passed from view in the general direction of Jackson.

I went into the house and telephoned the FSS, but they had no knowledge of a helicopter in the area. On the other hand, they told me that three young men, who had been lounging at Wedekind Park on Route 61 near the I-55 overpass, had seen the soundless object pass overhead and had telephoned the Cape police department.

I could determine the maximum altitude by using a topographical map, knowing the initial direction to the pseudostar, assuming an initial distance to the pseudostar, and using the angle of elevation of the moving light on the color slide. For an initial distance of 10 miles, the maximum altitude was 2,700 feet; for an initial distance of 5 miles, the maximum altitude was 2,100 feet, assuming that the object flew a level course from the initial hover position.

During the last two weeks of October, we didn't go into the field. The time had come to report our initial findings at a scientific meeting, as stipulated in my contract with the *Globe-Democrat*. From the beginning, my intent had been to bring truth and candor to the subject of UFOs, but at the time the contract was written, I didn't know I would have so much to report. I approached the task with some misgiving, because I didn't know how the report would be received by my colleagues in science.

I decided to present the report at the fall meeting of the American Association of Physics Teachers, Missouri Section, scheduled for November 17 at Meramec Community College in St. Louis. Being a former president of the organization and having hosted the meeting at Southeast Missouri State University in 1969, I felt that my request to be on the program would be given serious consideration. I telephoned an old friend and prime mover in the organization, Dr. Otto Hill, a physicist at the Materials Science Research Center, University of Missouri at Rolla. His response was, "Why sure. We need something far out to pep up the meeting."

My presentation was probably "farther out" than he had anticipated. The title of the paper was *The Anomalistic Lights in the*

Sky over Southeastern Missouri, by James E. Sage and Harley D. Rutledge. I left some of our experiences out of the presentation because I was not comfortable describing them in front of an audience.

Following the presentation was a question and answer session. Most of the questions from the audience of several hundred were timely and relative to the subject. At the end of the session, a number of persons remained to converse, including John Schuessler, an engineer with the McDonnell Douglas Corporation. He said that he was amazed at the amount of data we had amassed. From him, I was surprised to learn of the lack of serious field studies of UFOs using instrumentation. Apparently, our group had scored a first. In summary, the reaction of the scientists, media representatives, and the public pleased us.

NOTES

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2. *Cape Girardeau Missourian*, October 8, 1973.
3. *St. Louis Globe-Democrat*, March 22-23, 1975, p. 6A.
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8. Jacobs, *UFO Controversy*, ch. 10.
9. Jacobs, *UFO Controversy*, p. 277.
Klass, *UFOs Explained*, ch. 27.
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15

1973: UFOS IN THE WINTER MONTHS

As fall progressed into winter, the number of viewing nights decreased because of the inclement weather. Likewise, the number of volunteers for field work diminished, but Bob Adams continued to go anyway, lending his encouragement even though the winter environment was hostile to observers and equipment alike. And we continued to observe UFOs throughout November and December, and January and February of 1974.

At 5:15 P.M., CST, Thursday, November 29, I left my office earlier than usual. Twilight would soon arrive on that overcast day. As I neared my car in the parking lot, north of my office, I noticed a stationary, brilliant white light very low in the northeastern sky. It was not more than ten miles away, across the river in Illinois. Although the light's shape was somewhat flat, at first glance I mistook it for the landing lights of a commercial aircraft.

After watching for three or four minutes, I concluded that I was not seeing an aircraft's landing lights. For one thing, the light was flickering with large variations in brightness, like the flame of a candle fanned by a draft. Then, too, the light appeared motionless. Of course, an aircraft in the distance with landing lights on can appear to remain motionless for some time, but *eventually* the observer must detect motion of approach. This light was not approaching, and I was viewing in daylight, not at night as is the usual case.

By this time, a dozen or so students had gathered. One, newly arrived, exclaimed, "Oh, look! There's a UFO!" I inwardly chuckled at his certainty.

Because all the cameras were at my home, I could not photograph the light. Finally, I dispatched a student to Magill Hall to fetch Ueleke. I wanted to observe his reaction when he saw the light. But before Ueleke arrived, the light moved sideways to the right two or three degrees and went out. No solid object was discerned. The sighting was a precursor of events later in the evening.

By 7:45, Bob and I were set up on Blomeyer Road. We were disappointed because his much-needed Criterion telescope had been damaged in shipment and could not be aligned, so he had returned it to the factory.

Later, we watched a helicopter lift off from the Cape airport seven miles to the east and head our way. Through Ken Aldrich, we knew that the pilot of the helicopter was Major Lloyd Young, Missouri National Guard, of Scott City. I wondered why he brought the helicopter to Cape every weekend, even though the nation was in the grips of a severe oil crisis. Unwittingly, Young passed directly over our location, then turned the chopper east as if to return to the airport. We photographed the helicopter with the 800-mm lens as it made its turn. Next, it made a return pass over our heads, going west, as if searching the area, then it turned east for the airport for the second time. At that moment, a light came on in the northwest sky under the constellation Lyra. The time was 8:05. To us, it seemed that the object in the northwest had waited until the helicopter had turned before exposing itself.

Moving in the southerly direction, the light reached a position west of us, then brightened considerably. We took several time exposures. Continuing south, the light passed under the moon, which was about 30° above the western horizon.

An hour later, at 9:05, I said, "Bob, that star in the southwest appears to have a different color than the other stars. It's almost orange."

"You're right," he agreed. "Hey, that light is moving! I looked that way a while ago and I thought it was a star."

Like the first moving light, this one brightened as it reached a position west of us. I wondered why. As it continued north, we heard a piston-engine aircraft in the northeast, going south. As if on cue, the northbound light—now in the northwest—appeared to add a red pulsating light. It was not distinct from the two white lights, which we could separate in binoculars. Perhaps the red light was reflecting off

the surface of a craft, causing a source broadening. Or perhaps the light had been masked from our view by the craft's configuration. Certainly, the red light did not resemble the usual rotating beacon light. We estimated the distance between the southbound aircraft and the unidentified northbound craft to be at least five miles.

After dark on Monday, December 10, Mark and I were loading the car for a field trip to our familiar location on Blomeyer Road. We had been there Saturday night and on Nash Road Sunday night but had had no sightings. After placing the equipment in the car, I turned around to return to the house for another load. From the northeast, a light was approaching very low. Since early in the summer, when I had seen the bullet-shaped object, this was the first time I'd had a sighting while making preparations to go into the field. "Run inside," I yelled to Mark, "and get the binoculars!" I knew the light was moving too fast and would be gone before he returned. Even without binoculars, I could easily distinguish two white lights, fore and aft, of equal brightness. I was reminded of the night of June 4 on Nash Road, when Bob and John had seen a fuselage carrying two equally bright lights, although on that occasion, the lights were orange (Plate 22).

The soundless vehicle passed just southeast east of my house, at probably not more than a thousand feet high. When the craft reached the west side of Cape, I saw it make a sweeping turn to the northwest. I ran across the street into the neighbor's back yard and, through the trees, watched it recede. I thought I saw an indistinct red light on it; however, it was not alternating in brightness like a rotating beacon or flashing strobe light. Had the red light been on when it passed near my home, I couldn't have missed it.

By eight o'clock, Bob, Mark, and I were set up on Blomeyer Road in the driveway to a field. In the moonlight, we could see scattered cirrus clouds to the east, a light haze to the west. The cold was bearing down on us. I had three camera-lens systems set up on tripods and a Bell & Howell Super 8 movie camera loaded with Kodak daylight Ektachrome film, ASA 160. On one tripod was a lens-camera system of 50-mm focal length with a diffraction grating in front of the lens. Another tripod bore a similar lens-camera system, the camera loaded with infrared-sensitive film. In front of the lens was a Wratten 89B filter that would pass infrared radiation into the camera, but block out visible light. On the third tripod was mounted the 800-mm lens camera system. This camera and the one with the grating attached were loaded with sensitive Kodak 2475 film.

By this time, Bob had his now-repaired Criterion telescope

back from the factory. Between the telescope and the eyepiece, we had inserted a star spectroscope—another device for obtaining a color spectrum. But as we searched the sky, we were not sure how long we would endure the biting cold.

At 8:15, almost due west down the road, we saw a southbound light. Evidently, the light had not been on during most of its travel to the point where we saw it. We were accustomed to lights coming relatively close to us. As the light moved south, it seemed to disappear, then reappear again. It was in view for five minutes in all.

At 9:20, something very unusual happened. We had two consecutive sightings, one following immediately upon the other. Moreover, the first UFO went east of us (unlike the great majority of our sightings, which were in the west while we were set up on the floodplain southwest of Cape Girardeau). Following is a portion of the tape recording of the event:

H.R.: Don't get in front of my lens, Mark. . . . I shot a time exposure with the grating. . . . now the 800 mm. He looks fishy to me. I'll shoot the infrared now. . . . now back to the diffraction grating.

M.R.: Do you want the movie camera?

H.R.: Yes! Get the movie camera, Mark. . . . Bob, that is no airplane. He's almost overhead and no sound. . . . Can't see through the 800. What's the matter here? [The cable release attached to the camera was stuck.] Now I got it. I'm going to shoot a fast one on the 800. He's got a double light on him. Go ahead and shoot him, Bob. He may be a plane. I'm taking several shots with the 800. . . . now I'll take a trail shot. . . . got to kill [terminate] the grating shot. He's way out of the field of the grating camera. . . . take another one. . . . I've got to kill the infrared shot. . . . Here comes a car. . . . Infrared is pointed east and he's already northeast. Another infrared shot. Now kill the 800. Time it: 1000, 1001, 1002. . . . 1010. There's a ten-second exposure. . . .

B.A.: There's another one behind us! Look behind you!

H.R.: I'll swing the 800 around. It's very bright. Holy cow!

B.A.: Very low. It will pass to the west of us.

The second light, which was coming toward us, swerved to the northwest, the direction in which it finally disappeared.

By 9:35, it was all over. We had been very busy; even the cold had been forgotten. Bob had removed his gloves to operate the telescope's delicate controls, because tracking a moving object manually with a telescope using relatively large magnification is no easy task, especially at night. When Bob removed his hands from the controls, he left some of his skin behind.

Bob and I estimate that at closest approach, both objects came within a mile of our position, but we didn't hear any sound. The night was cold and still, the countryside very quiet. Sound travels well in cold air.¹ Had there been an engine sound, surely we would have heard it. Both craft displayed two white lights of equal brightness, one fore and one aft. Again, this improper lighting violated FAA rules. Both objects were identical to the one that Mark and I saw pass low over Cape earlier in the evening.

The infrared exposure (not reproduced here) indicates that the two lights on the first craft were typical "hot" or "thermal" sources of light. The pattern consisted of a straight light trail on the infrared-sensitive film, however, as did the exposures for other cameras where visible light fell on the film.

A photograph taken on infrared-sensitive film at Piedmont certainly was *not* ordinary. On the night of March 27, 1973, at Millers High Point, Dennis Hovis, Maude Jefferis, Bill Clark, and Gary Sutton—a student in Jefferis's high school photography class—observed white and multicolored lights flying back and forth between Brushy Creek and Clearwater Dam. Sutton said that a phenomenon repeated four times during the evening: First, a barely discernible orange glow would appear in the sky. Then, the "glow would pull in to form an orange light and travel a little ways." Moving left, the light would "increase in intensity and size." Last, it would suddenly vanish—"switch off."

Sutton used a 35-mm Petri camera with a lens of 400-mm focal length, a tripod, and cable release. The camera, although loaded with infrared-sensitive film, did not have an infrared filter over the lens. One of the exposures, approximately two minutes in duration, is shown in Plate 27. The photograph is strikingly similar to one taken by newsman Bob Campbell at Sherman, Texas, on August 2, 1965.²

Is it possible that a hovering helicopter discharged an enveloping mist or dust, then illuminated the material with an orange light, creating the effect that Sutton photographed?

On Friday night, December 28, Bob and I set up on Blomeyer Road again, but closer to Delta, near a power line. In spite of a cold, penetrating wind, Ken Aldrich and a student were perched on a fire tower near Chaffee. Occasionally we flashed our flashlights at each other to see if we could evoke a response, momentarily relieving the tedium of standing along the roadside shivering. No UFOs were seen; no exposures were made.

When darkness came on Saturday night, December 29, the sky was cloudy. I had almost given up plans to view; but at about

6:00 the sky cleared. I telephoned Robert and Gail Snider, a couple who were interested in UFO field operations. Robert was a physics major at the University, and his wife, Gail, taught English at Central High School in Cape. By 8:00 we were set up just off Blomeyer Road; actually, we used a private side road to avoid vehicle traffic. Also, because the side road ran north-south, we could set up a line of equipment that could be brought to bear in a westerly direction without other team members getting in the way. The night was cold and clear, and a sharp breeze blew from the east. The moon was bright in the southwest. It wasn't a good night to stand along a road and wait for something to happen—but happen it did.

At 8:10, in the west, we had a "bogey"—a light that brightened in about the same position as other lights had done on previous nights while we viewed from Blomeyer Road. When the light was directly west of us, Gail timed its transit, across a 7.1° field in 7×50 binoculars, to be about 20 seconds, giving an angular speed of 0.36° per second. If the light was 5 miles away, its speed was 112 miles per hour. Next, Gail spotted a stationary red light near the moon, but I could not see it.

Gail was a good observer. At 9:44, she spotted a northbound light 30° to the left of the moon. In my initial attempt to photograph the light, I could not see through the single-lens reflex (SLR) Pentax camera. I had covered the camera lens to prevent frost from settling on it, but frost had covered the camera viewing window. After wiping the window, I took two exposures while recording the action in detail on tape. Later that night, in my office at home, I discovered that the tape recorder, at this juncture, had been running slow because of the cold. After the recorder warmed up in my office, the playback was garbled.

At 9:43, we had a third sighting. This time Gail did not see it first. I picked it up almost due south and figured that it would pass overhead. But it didn't. The light veered off to the northwest, brightening while due west, and went out at 9:45. Because of the cold and because we had expended our film, we quit the field early.

Aldrich and some of his students had stationed in a field several miles to the south of us, near Chaffee, but could not maintain contact because of skip waves from Florida and Arkansas that masked our CB transmissions. (Radio skip waves are radio waves that travel from a transmitter to a receiver by reflecting from layers of ionized air molecules in the ionosphere as compared to radio waves that travel directly near the earth's surface.) When I got home, I telephoned Ken. According to our wristwatches, they had left their

location near Chaffee a few minutes before our last sighting. The light must have come very close to the field in which they had been viewing. I wondered: had they been present in the field, would the object have followed the same path?

Several of us in the Project who went frequently into the field purchased citizens band radios to maintain communications both in the field and at other times. Although we didn't attempt triangulation measurements, we did set up viewing stations several miles apart to give us a better perspective of the sky. And we built quite an audience among owners of CB radios.

Licensed operators cannot use their names on the air; the Federal Communications Commission requires that they all use call letters. In practice, however, most CB'ers adopt pseudonyms or "handles." Our group was no different. Bob was known as "Apollo," the Greco-Roman god, while Ken chose a mere star, "Betelgeuse," the red giant in the shoulder of the constellation Orion. At first, I tried "Rigel," another major star in Orion, but during conditions of poor transmission, the word was difficult for a listener to decipher. Eventually, I chose "Orion," the Great Hunter of Greek mythology. It seemed an amusingly appropriate handle—after all, I was a hunter too.

The year 1973 finally ended, and was acknowledged by ufologists as the year of the greatest UFO activity ever. Our work was barely mentioned in the literature, and I preferred it that way. But when we *were* mentioned, the truck driver incident was usually cited.

In 1973 Project Identification had logged a total of 105 sightings of 122 UFOs. Ten of these sightings were multiple UFO sightings. Of the 105 sightings, 23 were Class A sightings, while the other 82 were Class B sightings.

NOTES

1. Jearl Walker, *The Flying Circus of Physics* (New York: John Wiley & Sons, Inc., 1975), p. 8. (Edition with answers.)
2. J. Allen Hynek, *The UFO Experience, A Scientific Inquiry* (Chicago: Henry Regnery Co., 1972), Plate 2.

16

1974: END OF A UFO FLAP

During the winter, I sensed in some way that the UFO flap would last about one year; that it would be over by April 6, 1974. My records show that between the first of the year and April 6, there were twelve sightings; and only fourteen more the rest of the year. In 1974, only three sightings were Class A. But I used the spare time to begin upgrading our equipment.

The new year began with many nights of cloud cover. Seldom did we go out into the field unless the sky was clear. The much-heralded comet Kohoutek had circled the sun and was following a path out of the solar system. Although the comet's size and brilliance hadn't lived up to expectations, we still wanted to photograph it. On the night of the 21st, we remained at the Adams Observatory, where the 10- and 12.5-inch-diameter reflecting telescopes could be aimed at the comet.

On Thursday, January 24, the evening broke clear and uncharacteristically warm, and we didn't miss the opportunity to go into the field. We planned to set up farther west, somewhere in the vicinity of Advance. Another member of the astronomy club, Frank Bagbey, was going into the field with us for the first time.

We headed for Advance on Route 25, Bob Adams and Bagbey following my car in Bob's pickup. Using Channel 20 of our CB radios, we discussed the large number of private aircraft circling in the sky to the south, the pilots taking advantage of springlike weather. As was my habit—a dangerous one—I glanced frequently at the sky through the windshield. My persistence paid off.

When we were within a few hundred feet of our destination, a side road off Route 25, I noticed a white light approaching from the north. "Hey, Apollo!" I yelled into the microphone, "That light is going to pass right over us!" As if in response to my radio call, the light made a sharp turn to the west. Immediately, we turned left onto the side road, parked, and got out quickly. Before I raised binoculars to my eyes, I noted the time: 8:30 P.M., CDT.

Through binoculars, I easily discerned two lights of equal brightness, one fore and one aft. While still relatively close, both lights dimmed perceptibly. I told the others that the object was headed for Piedmont.

After it disappeared in the distance, we discussed several curious aspects of the sighting. First, the time duration of the turn was less than two seconds, reminding me of the one made by a light approaching Pyle's Mountain on May 18. Second, although we never saw a fuselage or wings, the lights didn't appear to "bank"; they just made a short-radius horizontal turn. Third, although we estimated that the lights approached to within one-half mile of our moving vehicles at an estimated altitude of 2,500 feet, we never heard any sound. We didn't hear sound after we parked and turned off our engines, either. Fourth, although the lights were closer to us than the aircraft to the south—and despite the fact we saw the object clearly through binoculars—no navigation or anticollision lights could be seen. These lights were easily identified on the aircraft to the south.

On Tuesday, January 29, Bob, Frank, and I went to Nash Road, accompanied by a new member of the Project: Jim Hickam, a member of SEMAC, who taught science at Jefferson School in Cape. The large, jovial man always wore a grin and his light red hair was trimmed in a flat top. We were set up by 7:45 P.M., CDT, and 30 minutes later we had our first sighting—a yellow flash to the north.

About 9:15, we picked up a single pulsating light in the southwest, about 15° above the horizon. In the distance, the light had a red tinge to it, but as it got closer, the red tinge disappeared, changing to white with some yellow showing. Looking through the Criterion telescope, Bob could not make out any strobe light or navigation lights. In the west, it brightened twice, then went out. "He must have forgotten to pay his light bill!" Hickam said.

At 8:20, we saw a triangular-shaped configuration of red and white lights that came on high in the west. At least three red lights were showing. The eastbound configuration continued east until out of sight five minutes later.

While we waited, the sky cleared and the wind picked up out of

the southwest. At 10:10, we saw a northbound orange light that appeared to pass over Cape, then go out. Bob was watching it in the Criterion telescope while the rest of us observed through binoculars. To all of us, it appeared as just a ball of light. No other lights required by FAA regulations could be discerned, although we had no problem distinguishing these lights on two aircraft that landed at the airport during our sighting.

On Thursday, January 31, Robert Snider and I were on our way to a high hill north of Advance. At about 7:00, we were west of Blomeyer, driving west on Route A. We wanted to arrive at the Leonard Huffman farm, where we would set up before dark. As we rode, we could identify several B-52 jets in the sky, the sun reflecting off their vapor trails.

Due west of us was a small ball of light. At first, it appeared pink, purple, and yellow. In a few minutes, its appearance changed to that of a butane torch pointing downward. To be safe, I had Robert take a few exposures. Eventually, we identified the light as a vapor trail of another B-52. Presumably, the large jets were from Blytheville Air Force Base in Arkansas, where they had operated since returning from Southeast Asia in the late summer of 1973.

After arriving at the Huffman farm, we set up our equipment in bitter cold. We marked the prominent features in the distance, especially the azimuth to a large natural gas terminal station on Route 74 about ten miles away. But at 9:20, we could hold out no longer. I radioed Adams and Hickam on Blomeyer Road, eight miles to the east, and told them to put their equipment away. "Apollo" advised us to meet them at his home.

Despite inclement weather, January had been very interesting.

Friday, February 22, was a clear day, and too cold for anyone to be outside for long. I wasn't expecting the telephone call from Snider at 5:00 P.M., suggesting a field trip. But before the evening was over, I was glad that he had called.

We left at 7:00 for the Huffman farm. By 8:00, we were set up and ready for the initial sky survey. Because of haze, all the stars appeared rather dim, especially the ones lowest in the sky. I completed a binocular scan.

At 8:04, I noticed a relatively bright orange star to the west about 5° above the horizon. Surely, I thought, I would have noticed a star that bright during my scan of the sky not more than four minutes before. It was on the same line as a lone mercury-vapor light at a farm about two miles away. Immediately, I looked at the "star" through binoculars.

"Look at that light, Bob," I said. "It's scintillating red, white,

and green. It's just like the one I saw from my yard back in October."

"Oh, it looks like a star to me," he responded.

"Well, compare it with the other stars on the horizon!" I said, as I started to cock the camera. "I'm going to take a picture of it with the 800."

"It sure looks like a star to—oops! It just went out!" he said. "There's another one over there!" he added, sweeping his binoculars to the right. He was right. Another pseudostar was hovering about 10 miles away and 10° to the left of the building complex of the Natural Gas Pipeline Company of America. When I put my binoculars on it, the light went out.

Continuing to traverse to the right with my binoculars, I picked up a third pseudostar hovering to the right of the complex. At that instant, it too went out!

"Bob, that's too much of a coincidence. Whoever is in those vehicles must know we are observing them," I said. "This sort of thing has been happening to me all year!"

"It does seem sort of strange," he admitted.

The presence of the scintillating pseudostars did not greatly surprise me. Back in October, a man living near the building complex telephoned to say that he had observed starlike lights hovering in the sky. In response to his call, Aldrich and I had gone to the complex on a dark, overcast night, but hadn't seen anything unusual during our hours on watch.

During the next hour, Robert and I endured a cold, biting wind from the south. A little after 9:00, I gave the word to pack it up. Just as I was unscrewing the lens hood on the 800-mm lens, I spotted a white light in the south at an azimuth of 184° .

The time was 9:14. The light, which had already approached somewhat before I had noticed it, was very white, atypical of the orange and amber lights I had seen so often. Quickly, I tightened the lens hood, turned on the tape recorder, and began a 25-second exposure (Plate 28).

The light moved very slowly. At one time I thought it had stopped moving, but Robert said there was motion. Then the light speeded up and brightened, and I took a 30-second exposure (Plate 29). A few seconds later, the brightness diminished. I took another 30-second exposure (Plate 30). The light was getting so close that I had to get on my knees to aim the barrel of the 800-mm lens at it.

As it passed nearly overhead, Robert shouted, "All right, I got a bunch of lights now. It's a cotton-picking jet! I can hear him now." Robert, who was observing through binoculars, was right. We could make out individual lights, instead of the ball of light we saw on

approach. In Robert's opinion, we were watching a large jet flying well below Jet Airway J-35.

Oddly enough, the light that had approached our position somewhat before we saw it took six minutes to reach a position even with us, and only three minutes to disappear in the distance after passing our location. Remember, at one time in its approach, I believed the light to be hovering. During this time the brightness varied considerably. During this time the jet was due west of our other viewing station (Adam, Hickam), located on Nash Road. Also, Plate 28 shows that an additional light was turned on. Judging from the amplitudes of the motion, the light was attached to an appendage of the aircraft, such as a flexible wing or tail section.

I radioed Bob on Blomeyer Road. He had identified the jet through his Criterion telescope and described the flashing red light on it. We agreed to meet at his home to discuss the sighting further.

On Saturday, March 30, Bob and I went to Perryville in response to a request from Vicki Hahn, a teacher at St. Vincents High School in that town. She and her husband had had a strange experience involving a UFO and asked me to investigate. While there, we had a Class B sighting of a white light that went off and on several times while making a large turn from north to south. By mid-April 1974, judging from the decline in personal sightings and the decline in sighting reports from others, I suspected that UFOs had abandoned southeast Missouri. But I was wrong. Sighting reports continued to be received sporadically by other members of Project Identification. At night I occasionally received telephone calls from persons who claimed to be seeing a UFO. In most cases, bright stars like Capella or bright planets like Venus were the culprits.

I have forgotten the exact dates of two other sightings in the spring of 1974. In one case, it was dark when Bob and I had just left his home on Route 74 to drive to Blomeyer Road. About a mile down the road, I saw a stationary bright white light high to our right and behind a tall hill. Although it looked more like a planet—no planet could be there—I asked, "Bob, what is that star up there?"

Caught unaware, Bob answered, "Gosh, I don't know . . . hey, let's check it out!"

By this time the light had become masked by the hill, part of a ridge system. Quickly I turned the car around in the road, but when we got back to where we had seen the light, it was gone. As I recall, we had no sightings during our hours on watch at Blomeyer Road.

The other sighting, brief in duration, occurred on a Saturday night, after midnight. After arriving home from my office at the

University, I checked the sky before going inside. While scanning straight overhead, I saw a thin pencil of light come on and make a 180° turn, east to west-by-south. It didn't look like a searchlight beam: it appeared to be several miles high, it didn't broaden, although I was viewing it from the side, and it came to an abrupt end. I had the feeling this was no mere coincidence.

Research on searchlight beams has shown that the beam does not appear to end abruptly when viewed from the side at a considerable distance.¹ The explanation involves the theory of scattering of light from particles in the atmosphere. In perfectly clean air, the beam would be invisible.

I have one report from a Missouri couple who claim to have seen a beam of light that did not widen and ended abruptly. The beam originated from a landed vehicle at night. It came down through a low, heavy overcast as a white sphere of light, changing to an orange disc-shape as it neared the ground in a field. A light mist was falling. That the beam was not like a searchlight disturbed the observers. (Obviously, they could not have seen the beam unless some light was scattered to their eyes.) The beam was turned toward their car, but did not illuminate it. When the disc-shaped light moved toward the car, they left in a hurry, the wife and two teen-age girls screaming.

From the front yard on Sunday, May 12, Mark and I watched an apparent satellite pass to the southeast at 9:05 P.M. As measured through binoculars, it covered seven degrees in fourteen seconds—an angular rate of 0.50° per second. This one was followed by a second apparent satellite at 9:07, traveling an azimuth slightly to the east of the first satellite.

A few minutes later, a northbound light of similar color passed to the west of Cape. I tracked it through binoculars until I could no longer see it. At that moment, I was looking directly at Polaris, the North Star. Moments later, we saw another northbound light, almost orange in color, which soon became masked by large trees in the back yard across the street. It never came out from behind the trees as it should have, considering its flight path.

Immediately, we saw a fourth light, identical in color to the third light, in the southeast. It too was northbound; it too became masked—by a young maple sapling in my front yard. The light never appeared on the other side of the tree! When I changed my position to examine the sky behind the tree, the light was gone. Perhaps the two Class B sightings were merely a coincidence.

By summer of 1974, Mark and his friend, Chris Watson, who lived about a block away, had developed a keen interest in astronomy,

photography, and UFOs. Frequently they set up their own equipment in the front yard, at times staying up for the entire night. But I did not consider them as members of the Project until they reached age sixteen.

The night of May 17, I went outside to converse with the two boys and we promptly had a Class A sighting. An erratic strobe light (ERSX) suddenly appeared to the southeast over the house, moving in a curved path to the north. It moved through an angle of at least 30° . None of us thought that it was a lightning bug because the flashes were the color of xenon—exceedingly sharp, and very high.

One Sunday night during the spring I received a telephone call at home from a man living on the south side of Cape. He said that a UFO was hovering west of the city and assured me that he was *not* seeing Venus. I told him that I would drive to the west side of the city to check it out, and did—but all I saw was bright Venus in the sky. I figured the man had been mistaken and went on home, without bothering to tell him of his misidentification.

The following Sunday evening, he called again with the same story. I patiently explained to him that he was seeing Venus. Perhaps he should make a reference mark on his window; Venus would lower in the western sky at about 15° per hour, and it would set like the sun and the moon. He didn't argue; he just hung up. I had won my point.

Next, I went out into the street to check on Venus. About that time, my wife came to the front door and told me that the man was on the telephone again. I returned to the house. When I picked up the phone, he said, "That may be Venus, but it just shot north, stopped under a star, and shot back south again!"

I assured him that Venus couldn't execute that kind of maneuver. But after he hung up, I still wasn't sure it really happened the way he described.

Five nights later I changed my mind.

On Friday evening, two of my daughters, Teresa and Susan, came home with their dates. The girls charmed me into showing the boys the wonders of the heavens through a new Celestron telescope with eight-inch diameter mirror, recently purchased by the Physics Department. Mark helped me set up the telescope. Because Venus would soon drop behind trees in the back yard across the street, I chose to aim the telescope at Venus first. I had just gotten the planet centered on the finder scope's cross hairs when I raised my head slightly to transfer my eye to the eyepiece of the main scope. At that instant, a light streaked south, originating exactly on line with Venus. Mark immediately ran across the street, and I called to him, asking why. "That wasn't a meteor, Dad!" he replied. I had to agree with

him. Now I wondered if UFOs hovered in the dark around the perimeter of the city.

On Friday, June 21, Ken Aldrich, Mark, and I were set up at our familiar spot on the Blomeyer side road. With us was Jim Kirkwood, a former SEMO University student who was working on his Ph.D. in mathematics at the University of Oklahoma after a four-year stint as an officer in the U.S. Air Force.

At 9:35, I recorded that a few airplanes were about, and that we had gotten a glimpse of a satellite going east. It was not yet completely dark. The wind was blowing, and the crescent moon was hidden behind a cloudbank in the west.

At 10:20, we saw a lighted object that had no anticollision lights. Immediately after we located it, the light went out, came back on again, and went out permanently at 10:32, never having moved far from its location in the southwest. At 11:25, we quit. The cool breeze had subsided and we were hot. A farmer in the field to the west of us was still disk harrowing.

On June 25, Kirkwood and I set up on the west side of a corncrib on the Huffman farm. The sky was very active, but the Class A sighting occurred after midnight.

We had gathered our equipment to leave. As I opened the car door, I took one last look at the sky. A xenon-type strobe light fired off six or seven times at a flash rate of about 4 per second. After misfiring for three or four flashes, it fired six or seven times again. Even to the naked eye, the path was jagged; it seemed to be about one-half mile high to the northwest, at a high angle of elevation. This was the second ERSX I had observed, the first being on May 17 from my front yard.

On Friday afternoon, June 28, Jim Kirkwood and I started for Piedmont, followed closely by Ken Aldrich and Jim Hickam. We went directly to Sam A. Baker State Park, where the other team went to the fire tower on Mudlick Mountain. Kirkwood and I located in a pasture at Camp Lewellen, a facility for Boy Scouts from the southeast Missouri district.

We selected a spot with an open view, one from which we could see the upper structure of the fire tower four miles away, and pitched Kirkwood's blue and white tent, which held two persons. We set up our equipment, ate a cold dinner, and threw a Frisbee until dusk. After dark, we were very busy with a number of aircraft, satellites, and lights we could not identify. Occasionally, we signaled the team on the tower with a few flashes from a General Radio Model 1538A xenon Strobotac. They couldn't miss those sharp flashes; they responded by flashlight.

One sighting was logged as a Class B UFO. Kirkwood picked

it up at 9:15 in the east, going southeast. To him, it was as bright as a second magnitude star like Polaris. At first, through binoculars, it appeared to be two white lights stacked vertically. Seconds later, as it receded, they blended into one light, as expected. The light would not have been classified as a UFO had it not gone out—at the instant Kirkwood and I lowered our binoculars!

About midnight, Scout field director Mike Toney came over to the field to chat with us and to get ready for his class on viewing the night sky, with which Boy Scouts are expected to be familiar. Mike told me about a number of sightings in the Piedmont area. A girl who worked in the Toney Drugstore in Piedmont told Mike that she had seen a large object from which smaller ones exited. She said that they would come out and go back in several times. (I had heard similar stories.)

Mike related a personal sighting that seemed to parallel the one I had witnessed in the soybean field at Sikeston in early October 1973. He and his girlfriend were driving on a country road one cold, clear night when they saw a light come over a distant hill. When they stopped the car to look, the light continued to approach. Mike said that he could see three square windows, closely spaced and yellow in color.

They became scared. When the girl jumped out, the dome light of the car came on, and the three lighted windows went out. Mike estimated that the object passed over them at a height of less than 600 feet—silently.

At 2:00 A.M., our valley became covered with fog. We were about 500 feet from a stream, and the condensation was extremely heavy. We were cold too, so we retired to the tent; but we did not sleep well on the hard ground. Who would have thought that we would need an extra blanket or two in the middle of the summer?

The next morning I took off the plastic covers that had protected the equipment from the dew and put the equipment away. After a hasty breakfast, Jim and I saw a young man approaching. As he neared, I recognized Harry Willson of Piedmont, an earth science major at the University and, like Mike Toney, a Scout field director. During our conversation, he brought me up to date on local UFO sightings, then he left to conduct a .22-caliber-rifle target practice with some young Scouts.

Later in the morning, Kirkwood and I went to a cabin that had been donated to the Scouts by a Sikeston businessman, Joel Montgomery. We had a delightful conversation with a young Scout director from Scotland who was staying in the cabin. After baths and

lunch, we rendezvoused with Aldrich and Hickam at the radio station in Piedmont. After a chat with Dennis Hovis, we went to Clearwater Lake and Dam for sightseeing and loafing in the park. When we got back to the radio station, Ken learned that his mother was ill. He and Hickam left for Cape.

I was curious about the view from the fire tower at Vulcan; when Jim and I visited there, I was not disappointed. The tower was practically in the well-kept front yard of a white frame house, where many flowers lent their color to the scene. No one was home, but I assumed that a park ranger live there. We pitched our tent on the lawn near the base of the fire tower.

Before dark, we made several trips up the tower, carrying observation equipment. We had a view in any direction to the horizon. But the wind didn't help our situation. Gusting up to 20 miles per hour, it caused the tower to sway perceptibly.

During the evening, we saw several aircraft. At 10:45, we had a Class B sighting: a light in the southwest, going south. It looked more like a satellite in polar orbit than a high-altitude aircraft—until it went out. About midnight, two young men drove in, climbed the tower, and visited for about an hour, with many UFO stories to tell. We quit our vigil soon after they left.

After breakfast, we packed our equipment and tent and drove back to Cape, arriving at 12:30.

On Friday, July 5, Bob Adams, John Wilson, and I went back to Piedmont again to meet Roswell Messing, a prominent St. Louis businessman, his wife, Wilma, and their guests, Mr. and Mrs. Charles Baron of Olivette. The Barons had been on Pyle's Mountain before, on Saturday night, April 7, 1973, the night after Ueleke and I went there the first time. They had sightings too,² but unfortunately, the Barons were to see no UFOs this night.

After dinner at a local restaurant, the seven of us went to the mountain, set up our equipment, and waited. By midnight, it was obvious that the UFOs wouldn't show. The Messings and Barons left for their motel—too soon, as it developed, for we were about to be treated to one of nature's spectacles, the northern lights. Only on one occasion (from a jet five miles up) have I seen them more beautiful. Fortunately, I had a wide-angle lens with me and I loaned it to Bob. He shot an entire roll of color film, while I exposed the display with a faster f/1.4 lens of smaller field. When we had finished, we left for Cape, arriving home at about 4:30 in the morning.

Although we set up twice more in July, we didn't have a UFO sighting until November.

By 6:00 P.M., CST, on Wednesday, November 27, Hickam, Wilson, and I were in position on the Blomeyer side road. A full moon hung in the eastern sky, and temperatures were in the low forties. Over the next two hours, we saw several moving lights in the northwest and southwest quadrants but they may have been distant aircraft. But at 8:10, John noticed a slow-moving amber light low in the northwest, at an elevation of between 5° and 10° . A definite red color could be seen through binoculars, but could not be resolved as separate from the amber portion of the light.

I viewed it through the Celestron telescope, using a 40-mm focal length eyepiece lens, giving a magnification of 50X, considerably more than the binoculars we were using. I couldn't resolve the lights either (Fig. 16.1a). Nevertheless, I didn't stop tracking to change from the 40-mm to the 25-mm eyepiece, with 80X magnification. On 80X, the light would have been difficult to relocate in the telescope.

The light, in the northwest quadrant, was moving southwest—which meant that it was moving farther west, away from us. I timed its transit across my field of view at nine seconds, giving an angular speed of only about 0.06° per second. Truly, it was quite distant. In the telescope, the amber light appeared as a relatively large ball of yellow light that appeared to scintillate and sparkle. At times, the top of the ball showed a red tinge.

Hickam, who was viewing the light in binoculars, suddenly exclaimed, "It just went out! The light just went out!"

"No, it didn't," I replied. "The yellow light went out, but there are still two red lights on it." One was a small, steady ball of red light, while the other was a larger red light that pulsed two times per second. The pulsing red light resembled the common area of two overlapping circles of equal radii (Fig. 6.1b). Both lights fit perfectly into the circle defined by the yellow ball of light I had seen before it went out.

The only conventional explanation I can present is that we had been viewing several external lights on a helicopter. I cannot accept that an internal cabin light produced the effect, however. Odd is the fact that the two red lights fit precisely into the circle of yellow light. Perhaps the flashing red light was reflected off the cabin from a rotating beacon light on the helicopter. That portion of the cabin would have to be opaque, because FAA regulations are stringent regarding the periodic variations of light from an airplane or helicopter's anticollision warning light system. Light from this system *must not* shine directly into the cabin, although reflections from wing

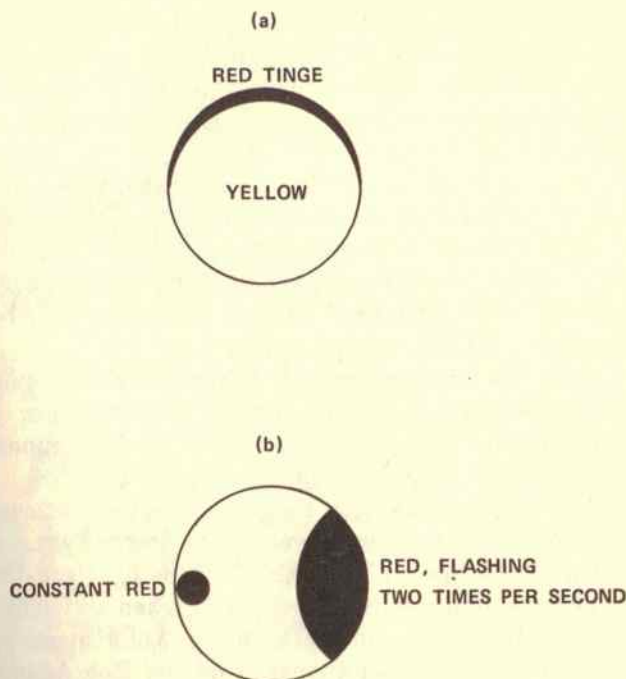


Fig. 16-1 View of a light through a Celestron telescope on 50X. In (a) the scintillating yellow light had a red fringe on top occasionally. In (b) the yellow light extinguished, leaving a small, steady red light and a larger red light that flashed two times per second

struts, wheel structures, or even the propeller, may be visible to the cabin occupants. If the aircraft enters a cloud, the effect of the rhythmic light reflecting off the surrounding water vapor is usually so severe that the pilot turns off the anticollision warning light system. If the system were left on, the pilot could suffer disorientation or flicker vertigo.³

At 8:25, we saw a light in the west that appeared to be farther away than the previous sighting. Through the telescope, I easily made out three white lights and a red light. One white light was brighter than the other two.

In late January 1975 a Carlyle, Illinois, woman had a similar sighting: an amber light followed her car for about fifteen miles, frequently displaying a red tinge about its circumference. Then, too, I was reminded of the Pingel-Colyer sightings from their aircraft on April 12, 1973, near and at Farmington.

On four nights in December, we set up equipment on the

Blomeyer side road. By this time, I had procured blazed transmission diffraction gratings to place in front of the camera lens, even when the camera was attached to the Celestron telescope. The more efficient gratings would enhance my chances of capturing the color spectrum of a UFO on film.

On December 13, the last night that the sky was clear in December, I was set up on the Blomeyer side road alone. To keep frost off the telescope corrector plate at the front of the telescope, I placed three handwarmers, suspended in an elastic band, around the telescope's barrel. The handwarmers were needed, all right; my thermometer read one degree below zero.

Using the camera grating attached to the eyepiece of the Celestron telescope, I photographed a mercury-vapor yard light about a mile to the east. Later, when the Ozark flight appeared north of Cape with its landing lights on, I photographed it too.

About 30 minutes later, I saw a light in the southwest moving north. Through the telescope it was just an orange light. I exposed it through the telescope and grating. Then the light got dimmer and nearly disappeared; finally, it went out. When the slide film was developed, this Class B sighting exhibited a color spectrum.

At 10:05, I had had enough. I missed Bob Adams and the others, and didn't much care for observing alone. I put the equipment away and went to visit Bob at his home.

The year 1974, just past, had been rather fruitful, better than I had expected. The Project was still viable, and I had plans to acquire more sophisticated equipment.

NOTES

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2. Gerald Meyer, "Piedmont Aerial Carnival Turns A Whole Family Into UFO Believers," *St. Louis Post-Dispatch*, April 20, 1973, p. 1.
3. Barry Schiff, *The Proficient Pilot* (Washington, D.C.: Aircraft Owners and Pilots Association, 1980), p. 63.
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17

FIVE YEARS OF ACCIDENTAL SIGHTINGS: 1975-1980

During the years between 1975 and 1980, we made few field setups; for the two-year period of 1976 and 1977, in fact, there were no field setups. Because of a change in administrative personnel at the University, my duties and my teaching load nearly doubled. At times, I was tempted to terminate Project Identification and store the data. But because of sporadic but continuing UFO reports from others living in southeast Missouri, and because of my own infrequent accidental sightings, I did not terminate the Project, and continued to check the sky on a daily basis. I had sequences of accidental sightings, mostly incredible, often from my yard, followed by long intervals of no sightings.

The year 1975 started off with an accidental sighting of the classic flying disc. At about 8:30 P.M., on Friday, January 3, my wife and I were returning home from a visit downtown. I was driving. The night was cold and dark; the sky was clear. When we were about 120 feet from our driveway, we saw a light emerge from behind trees in the yard to our left. Moving rapidly across our front to the east, it became masked by trees on our right. I asked my wife if she had seen the same thing I had. She described a flying disc. I concurred with her description (Fig. 17.1).

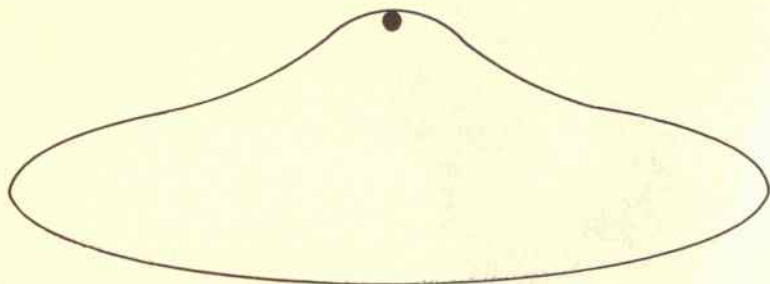


Fig. 17-1 Fluorescent-colored disc that passed over Westridge Street on January 3, 1975. Note light at top of the dome

The semi-convex disc was self-luminous, the color of a fluorescent light or a TV screen that is momentarily blank. I also made out a dim yellow light at the top of the dome but not protruding above it. My wife didn't see the small yellow light, but the disc was moving so fast that detail was difficult to see. The surface of the dome did not differ from the rest of the surface; that is, no dome structure was apparent except its outline.

In reenacting the event, my wife and I estimated that the disc moved through 30° in about three seconds, maybe less, yielding an angular speed of 10° per second. In my opinion, the diameter of the disc was about 20 feet. It was very low, appearing to pass over the houses about a block away at an altitude of 500 feet.

The next day I told my good friend, Dr. Harold Hager, chairman of the Department of Mathematics at the University, that a disc had passed over his house. The laconic Hager had little to say, but he didn't disbelieve me, either. Several years before, he and his wife Jeanine had seen a peculiar vehicle with windows in the vicinity of Rolla, Missouri.

On January 24, I received an incredible report about a teenage girl who was chased by a UFO in an area known as the Landgraf subdivision in the middle of Cape Girardeau! Lori Klinkhardt, age 14, described the object as "about four times the diameter of a Frisbee." On each side of the disc a blue light glowed; there was a red light in the rear, and a dominant white light in the middle. Just as Lori reached the carport of her home, the object overtook her and flashed a bright light down on her.

The latter part of the episode was observed by a neighbor girl, Sandra Peterman. Lori's mother observed the flash of light from inside the house. According to Lori's mother, Lori rushed into the house crying, "Mom! Mom! I can't see!" The effect persisted until she went to bed. Her eyesight was normal the next morning.

After learning of the incident a few days later, I took Lori to a local ophthalmologist for an eye examination. He found no retinal burns or other eye damage.

Landing sites are of particular interest to ufologists because of the interaction with the environment. Effects on soil may include the destruction of organic materials, loss of more volatile elements or compounds, introduction of metallic elements to the soil, residual radioactivity and magnetism, possible recrystallization of minerals present in the soil, and introduction of foreign materials in solid or liquid form.¹ I investigated a few alleged landing sites—"alleged," that is, unless a UFO had been seen to land or leave the vicinity of the site.

One particular case was brought to my attention by Tony Legrand. On July 19, 1975, Charlie Baldwin, vice-president of the Davis Electric Company in Cape, Legrand, and I went to a farm near Glenallen where we met with the tenant. He took us to a flat area near a cattle pen that adjoined a barn. A few feet south of the pen was an annular ring ten inches wide and fourteen feet in diameter, the latter measurement often reported in landing site cases.² The tenant told me that he had discovered the ring almost three weeks before. At that time, he said, the "ring was very distinctive," although now the grass was growing into it on the side nearest the pen.

We took soil samples using clean plastic spoons, placing them in clean glass jars. Samples some distance from the ring were taken as controls. The area was checked for residual magnetism, for radioactivity, and for foreign material. We photographed the ring with black-and-white and color film, using a variety of filters, and with infrared-sensitive film.

Samples were given elemental analysis in 1976, using the tedious atomic absorption techniques (Jarrel Ash AA/FE spectrophotometer), and in 1978 more extensive tests were made using a scanning electron microscope where the results were displayed on a computer screen (Princeton Gamma-Tech ISI Super I scanning electron microscope). The elements found in the soil were in the same abundance in the control samples and those taken from the ring area.

Interestingly, the incident involving the white sphere of light that drifted downward out of the overcast and changed to an orange disc-shape occurred on July 12, 1975, about five miles from the farm.

For a while on Saturday night, August 30, Mark and I suspected we were observing a pseudostar. There was an extra star in the constellation Cygnus. Because it remained in position, allowing us to photograph it at our leisure, we concluded that we were seeing a relatively rare astronomical event, a nova. (A nova is a star that becomes unstable and blows off excess material, flaring up brightly for a period of a few days to several weeks.) The next day, we read in the newspaper that it was indeed a nova, first discovered by a Japanese schoolboy. Because of the overcast in our area, we had been unable to see it until Saturday night. At least Mark had the distinction of discovering the nova locally, although the ever-alert Bob Adams had found it too.

The only other sighting of 1975 came on the night of November 8, during one of four field trips for the entire year. I had been receiving reports of strange lights—even huge furry creatures!—in the vicinity of Egypt Mills, just seven miles from my home.

At 10:30, Bob Adams and I had been set up for about three hours when an off-color white light approached from the north on line. By this time, we had seen several aircraft, but we carefully watched this slow-moving light through binoculars. When it was about two miles away, it turned abruptly west. The sharp turn reminded me of other lights I had seen. Through binoculars, two lights of unequal brightness were in line. No other lights required by FAA regulations could be seen. The light was in view for about five minutes.

On Sunday, June 20, 1976, twilight was waning when my wife and I set out for a leisurely walk around the Oak Hills subdivision, where we live. As we were nearing the bottom of the first hill, I picked up the flashing red lights of a commercial Ozark flight headed for the airport south of Cape. The flash pattern was familiar because I had seen it many times: a red rotating beacon on top of the fuselage and another on the bottom, the two lights offset somewhat. I watched the shape of the airplane as it made its way over the southeastern part of the city.

After walking about 100 feet farther, I looked up to check the sky again. I had made a habit of doing this because of the high incidence of UFO appearances at or about the time an airplane had passed by. I looked in the direction where I had first seen the airplane, expecting to see the constellation Cygnus and bright Vega in the nearby constellation of Lyra. But I became confused. There were two Vegas! At that moment, I did not know which was the real star and which the impostor. The pseudostar was identical to Vega in both color and brightness.

About five seconds later, I pointed toward the stars, saying, "Hey, there's something funny going on up there. Look at that!" Then, before my wife could look up, the pseudostar to the right of the real Vega went out. It did not switch off instantaneously, but dimmed out in about one half-second.

Quickly, we retraced our steps up the steep hill back to our house while I debated whether to telephone the pilot at the airport. The light had appeared to be about 2,000 to 3,000 feet above the path of the Ozark aircraft. Before reaching home, I decided not to telephone: the light had not been visible when the airplane passed; hence, the pilot couldn't have seen it.

Instead, I photographed that area of the sky with a 50-mm lens camera system. I made three exposures on black and white film, each of 10 minutes' duration (Plates 31, 32, and 33). Only the star trails, caused by the rotation of the earth, appear in the first two exposures, but the pseudostar shows up faintly in the last exposure. I never saw it, however.

At about 7:15, on July 15, 1976, I had left the I-55 ramp to Route 74, on my way to the Adams Observatory. Ruth, Mark, and Chris Watson were along. The boys and I would stay for the astronomy club meeting. Ruth and the boys first noticed the off-white light hovering far south of the airport. Just as I glimpsed the light, it went out. This daylight sighting was labeled Class B. Even though we could not make out a solid object, I could not be positive that it was not an aircraft with landing lights on.

After the astronomy club meeting, we stepped outside to enjoy the view of the dark, clear sky. Immediately, I looked to the north. There, over Cape or beyond, was a starlike object. "What star is that, Bob?" I asked.

"I don't know," he replied. No one else volunteered an answer either. In a moment we knew; the light went out and became a Class B sighting.

At about 10:30 P.M., on August 21, 1976, I stepped outside to check the night sky. Our family had arrived at my parents' home in Iowa, at Lake Manawa in the southeast part of Council Bluffs. When I looked to the west, toward Omaha, I saw a light that I figured to be an aircraft, because the Strategic Air Command Headquarters (SAC) lay a few miles to the south of Omaha. But the light wasn't moving. It exactly matched the star Arcturus in color, and was nearly as bright. The angular separation of the light and Arcturus was about five degrees.

About the time that I realized the light was not moving and that it wasn't an aircraft, it went out. No physical form could be seen

in the glow of the city lights of Omaha, but the distance to the light may have been ten miles or more.

Students often come to my office to discuss UFOs in privacy. Before the conversation ends, they usually ask me where I see UFOs. I respond that I have seen them from various locations about the countryside, and from the city, including my front yard. I used to add, "But I have never seen one from my office window."

When I arrived at the office on Sunday morning, September 5, 1976, the clock on the wall read nine o'clock. Before sitting down to work, I looked out the large, second-story window facing north, over the entrance to Magill Hall of Science. The sky was light blue and cloudless with calm air, the sun warm on the landscape. All was quiet; I was alone in the building. My yellow 1969 Mustang was the only car in the parking lot. Nothing moved except an occasional sparrow flitting about the birdhouse on a pole some distance from my window. What a beautiful day! I thought. I would rather be playing golf.

Sitting down to the task at hand, I put my thoughts of golf aside. In this position, light from the outside fell on my desk from the rear, and nothing outside distracted me.

At exactly 10:30, I turned in my swivel chair to look outside and rest my eyes. High in the sky, and on line with the birdhouse, a flash of light caught my attention. In one brief instant, I had a glimpse of a disc shape—somewhat similar to the World War I helmet of the American soldier, and similar in shape to the disc my wife and I had seen in early January 1975. The disc shot upward at a very steep angle, slightly to the right. The leading edge appeared to accelerate or move before the back part, presenting a stretch effect. Within two to four degrees of arc, the disc simply faded from view (Fig. 17.2). The fadeout effect was not caused by the disc receding in the distance, for the disc was traveling almost perpendicular to my line of sight. The whole event may have lasted one fifth of a second.

Immediately, I checked my surroundings to see if the event had somehow been produced by reflected light. First I checked the reflections of the office fluorescent lights from the large window. But because the outside daylight illumination was much greater than that of the fluorescent lights, I eliminated these reflections as a possible cause. Next, I checked the location of the sun to see if direct sunlight on the window could have produced the effect. Not possible: the sun was behind the northeast corner of the building, and my office window was in shadow. Then, I looked for a source of reflected sunlight outside my office—in particular, a moving specular reflector (smooth surface) such as the windshield of a moving car. My

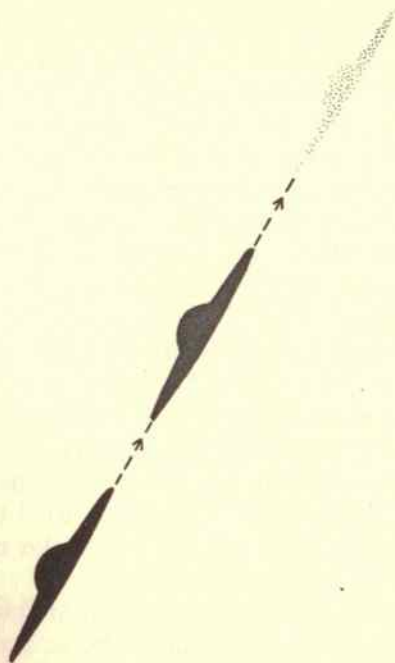


Fig. 17-2

stationary car was the only one in view. Last, as I looked out the window, I moved my head to various positions, but I could not pick up reflected sunlight from any smooth surface. I concluded that in spite of the short duration of the sighting, I really had seen the classic daylight flying saucer.

The fadeout effect intrigued me. In my opinion, the object moved so fast that not enough light, reflecting from the object, entered my eye to stimulate the cone receptors in the retina.³ A similar circumstance can be experienced with a camera, when a speeding object may fail to register on film because too few photons reach the film emulsion to register a latent image.

On October 26, 1976, Bob and I drove more than 50 miles to Lilbourn, in response to a woman who telephoned to say that she had been observing UFOs. Actually, she had been seeing the three stars in the "belt" of Orion. Low to the east on cool fall nights, these stars scintillate their brightest. Originally, I feel, she had had a bona fide UFO sighting, which sparked her interest in an unfamiliar night sky. But shortly before we arrived at Lilbourn, Bob and I did have a Class B sighting, a hovering light that disappeared while the terrain masked our view of it for a few seconds.

In 1977, I had six accidental sightings, but three of the four Class B sightings occurred one night over a span of a few minutes. Two of the six sightings were Class A.

On June 20, 1977, exactly one year after my sighting of the pseudostar near Vega, I had a somewhat similar experience, except that it happened soon after an evening stroll through our subdivision. Ruth went inside, but I stayed in the yard to observe the sky. At about 10:30, I watched a dim light, of about third magnitude, traveling toward Alkaid, the first star in the handle of the Big Dipper, with a star magnitude of +1.9.

Astronomers use a star brightness magnitude scale such that a star of magnitude +1 is about 2.5 times as bright as a star of magnitude +2, and is about 100 times as bright as a star of magnitude +6, which is so faint that few persons can see it with the naked eye. The stars Spica and Pollux are about magnitude +1 stars, being +0.98 and +1.15, respectively. Telescopes, used to detect fainter stars, have been constructed with large-diameter mirrors that can detect stars fainter than magnitude +23.

Stars of negative magnitude are even brighter than those of positive magnitude. Sirius, the brightest star in the sky (other than our sun), is magnitude -1.47. Venus, a planet, can be as bright as magnitude -4; our sun is rated at about -27.

In other words, the moving light was not as bright as Alkaid. I assumed that the off-white light was a high-altitude aircraft. But the sequence of events that followed seemed to eliminate that possibility.

When the light got to within about three degrees of Alkaid, it simply disappeared. I peered ahead of the point where it vanished, thinking that I might pick it up again. Perhaps the light had been obscured by haze or cloud. But all the other stars in the vicinity were visible and steady in brightness.

About that time, I saw Merak, the lower pointer star of the Dipper, flare brilliantly, taking about one second to reach maximum brilliance and go out again. I turned my attention to that region of the Dipper. Obviously, I thought, the star itself didn't flare; something had to be hovering exactly on line with me and Merak. I recalled the night that a pseudostar had originated on line with my telescope and Venus.

I was surprised when the light flared again a few seconds later. This time it was about 3° or so to the right of a line joining the two pointer stars and positioned about half the distance between them (Fig. 17.3). For an instant, I thought that all of southeast Missouri would be illuminated, but as before, the light subsided in

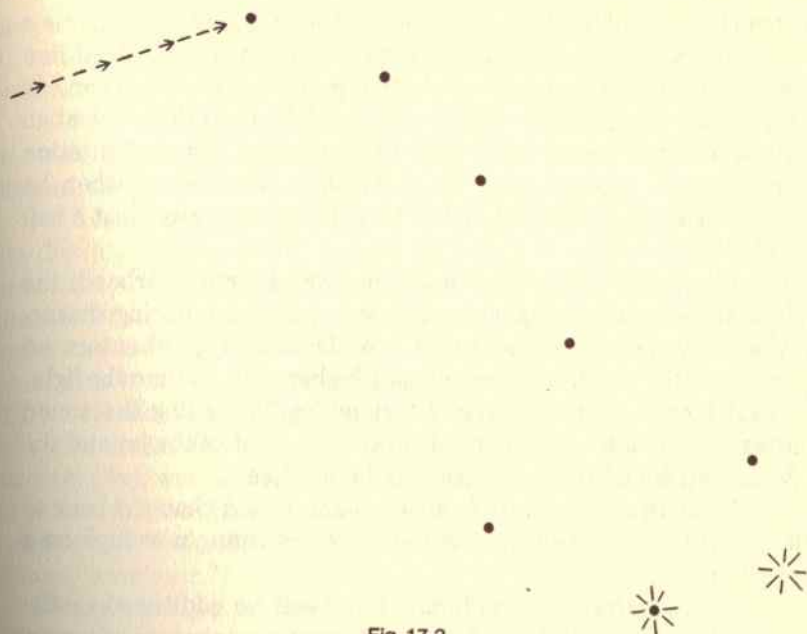


Fig. 17-3

about one second. Other persons had told me that they had seen large areas of terrain illuminated by hovering lights. In one case, a woman saw the phenomenon from a window of her rural home at about four o'clock in the morning. Apparently it happens most frequently after midnight.

Friday evening, October 7, 1977, I awoke from a nap, alone at home in the dark. The rest of the family had gone shopping. Without turning on the lights, I made my way out into the front yard where I discovered that a faint twilight persisted. To the northeast, I saw two very bright lights moving fast to the east. Both lights had passed my line of sight to the KFVS-TV tower. The light in back showed a pulsating red light. No problem there, I thought; it's an airplane. But the light in front was pure white. It could be a UFO, I surmised. My impression was that one light was chasing the other.

Within four seconds after I first saw the lights, the one in front went out. Now, my curiosity was aroused! The trailing light began to execute a curious maneuver. Instead of continuing on course, it began to make a figure-eight pattern. After completing the pattern, the trailing light continued on its eastward course. Because I was not positive that I had seen a jet-UFO chase—there was no sound—I decided to log the description in my files and forget it.

Twenty minutes later, additional information from Jon

Hickam confirmed my observation of a jet-UFO chase. A former Air Force electronics expert and brother of Jim Hickam, he lived five miles west of I-55 and more than five miles north of Jackson. At 7:15, he saw a bright white light coming up I-55 from the south at an altitude he estimated as 5,000 feet. As he watched, the configuration didn't change in passing by, as an airplane does. Even when he looked at the silent light through a 4X rifle scope, it was "just a ball of light."

When Hickam noticed a commercial airliner overhead, the light dimmed, soon changing to an orange color and turning sharply to the northeast. Then he heard a McDonnell F-4 Phantom jet diving from the northwest from a much higher altitude than the light. He said that the jet "was really highballing," breaking the sound barrier with its afterburners on. Hickam lost sight of the jet and the light behind some trees on a ridge to the northeast.

Moments later, when I saw the light, it had changed back to white. With the identification of the jet, the sighting now took on a new complexion.

To my surprise, I was indirectly to receive additional confirmation of the jet-UFO chase from another witness who was very near the sighting. A few days after the event, an Air Force cadet at the University came to my office to tell me about a jet-UFO chase that ended over Illinois. I checked the date with him; they were the same. He told me that a University student had observed the event from his vantage point ten miles north of Cape on Perryville Road. The student told the ROTC cadet that "a McDonnell F-4 Phantom had chased a UFO over into Illinois." The student had heard and seen the jet and, having spent a tour of duty with the U.S. Air Force, recognized the tail structure as that of an F-4. When the ROTC cadet came by my office to tell me of the other student's sighting, he didn't know that I too had seen the event and had received a report from another eyewitness.

On October 9, 1977, at 6:00 P.M., CDT, Mark and I went into the back yard to toss a football around. Not a whisper of air was about. We threw the ball back and forth a few times until I threw one over his head. As he was retrieving it, I had an urge to look directly overhead. Instead of looking around the sky at about 45°, as I usually did, I looked straight up—a difficult position for the neck. I instantly saw a small sphere the color of plastic, like polystyrene with a rough surface; i.e., not specular, but slightly diffuse. It moved perpendicularly over our yard in a straight line to the southeast.

I called Mark over, not taking my eye from it, because it did

not contrast with the clear sky. I pointed, but Mark could not locate it. In fact, he never did see it although I pointed at it during the several minutes it was in view.

After the sphere had traveled southeast for two or three minutes, it made a slight hitch as if to turn south, but went east instead. Soon it was out of sight.

I cannot say that it was not a balloon, but I have never seen one like it. Second, it did not reflect light any better once it was opposite us from the sun. Third, it didn't appear to be more than a thousand feet high, although I realize that the sky was featureless, and there were no visual clues. But disregarding my feeling of premonition, why did I look straight up and—more important—why did I see it that very instant, while Mark was unable to locate it at all?

In the fall of 1977, I was photographing Jupiter in the eastern sky every two weeks, always at the same clock hour. My purpose was to show students photographically how a planet changes its position relative to a fixed-star background. (In Greek, the word "planet" means "wanderer.")

On the night of November 16, while photographing Jupiter from my front yard, I noticed a bright point of light to the lower right of Jupiter and assumed that it was a star. The next night, I stepped out at about eight o'clock, to return to work at my office. I checked the sky, first looking in the direction of Jupiter and couldn't believe what I saw. A pseudostar, identical in color and brightness to the real star on the lower right, was to the upper right of Jupiter. Not only that, the two stars and Jupiter made an equilateral triangle, with three equal sides and three 60° angles (Fig. 17.4). I thought, "Hey, little star, you don't belong there!" Then the pseudostar obligingly moved about 3° to the right and went out.

The first sighting of 1978 did not occur until June 26. At 10:03 P.M., Mark stepped outside to go to the garage and took a

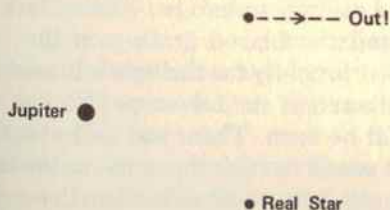


Fig. 17-4 The pseudostar to the upper right of Jupiter made an equilateral triangle with Jupiter and the real star to the lower right. The pseudostar moved over and went out

quick look at the sky. An extra third-magnitude star caught his attention about 2° west of Arcturus. About one second later, the pseudostar "dimmed out."

His next sighting of the evening was at 12:05 A.M. when he and I were on a walk through the subdivision. We were on Huntington Drive, the last leg of our route before turning onto Westridge. Mark, scanning the sky to the north, saw a first-magnitude star about halfway between Polaris and the horizon and a few degrees of the meridian. After he realized that it was a pseudostar, it flared to an approximate magnitude, -3, and "dimmed out." I remarked about his having had two sightings in one night, but he told me that one night, from the front yard, he had seen five, all of which reacted this way. Chris Watson saw them too.

During June 1978 UFO sightings and cattle mutilations were reported near Elsberry, Missouri, about 50 miles northwest of St. Louis. At the invitation of one of my students from Elsberry, five Project members set up equipment in a field on his father's farm, Plate 34. Because of hysteria generated by certain segments of the media, I decided to wait until media personnel had left the area. On the nights of July 2 and 3, Bob Adams, Jim Hickam, Mark, and I, along with John Huston, a professional cinemaphotographer from St. Louis, watched the sky, but we saw no UFOs. We did not investigate cattle mutilations.

On July 29, Mark and I set up on the Blomeyer side road where we listened to a St. Louis Cardinal baseball game as twilight slipped away. The planet Mars was relatively low in the western sky and not very bright. To the left of Mars, I noted a large area devoid of stars. It was not yet dark.

While Mark adjusted the radio, I turned to check the eastern sky for about five seconds. When I turned to face the west, sure enough, an extra light hung to the left of Mars. I yelled at Mark to look at it through the Celestron telescope. I could determine that the light was headed directly toward us. While Mark examined the light on 50X, I rotated the blazed grating on the 50-mm lens-camera system to orient it properly for the light's head-on motion. To Mark, a ball of light showed in the telescope. No lights required by FAA regulations could be seen. Then, just as I completed adjusting the grating and was ready to cock the camera, the light went out. A jet was crossing the sky, from south to north in the vicinity of the light and above it. The two events could have been related, or just coincidental.

Mark and I peered into the semidarkness, waiting for the object to either arrive on line or appear. It didn't. We never heard an engine sound near our position. The light had simply disappeared.

On November 8, I set up on the Blomeyer side road using two 35-mm cameras with gratings in front of their lenses and a Beaulieu 4008ZM4 8-mm movie camera. The moon was about 20° right of south and so very bright that I could see my shadow. The night was clear and cold. Orion was almost completely "up" in the east.

At 8:45, I watched a light approach from the south-southwest on a path that would take it west of my position. Through binoculars, I could see only a single ball of light. Then, before it reached Advance, it started a slow turn to the southwest. I watched it recede for several minutes, when suddenly I saw a bright amber light directly west, going north. Certainly, the light did not come from the south, or I would have seen it. My guess is that the object flew from the south with its lights off, turning them on when due west of my position. I labeled the sighting Class B.

Working as a team, John Wilson and I had seen many UFOs in 1973. John graduated from the University in 1974, later leaving the southeast Missouri area to work as a night assistant at McDonald Observatory in Texas. (He returned to the University for graduate work in physics in the fall of 1977 and will receive his master's degree in astronomy from Vanderbilt University in 1981.) I had confided to John my sightings subsequent to 1973, including my suspicion that the UFOs either reacted to me or were aware of my presence—a claim that I never made public. Apparently, John had not been convinced, but in September 1978, he was to change his mind.

While walking across campus one night with a friend, John noticed a stationary bright light to the east in the Great Square of Pegasus. He knew it was not a bright star or planet. After about 25 seconds, he pointed it out to his friend. When the friend looked up, the light went out.

On Thursday, May 24, 1979, Mark and I went to Farmington to set up in the field on the Fred Billedo farm. I hoped to reconstruct the sighting of the pseudostar that had appeared at the bottom of a vertical row of three stars six years before so that we could identify the two real stars. Unfortunately, friendly cattle harassed us and a rainstorm swept in from the northwest well before dark. We left the field, and when the rain had subsided, we went into Farmington so that Mark could get something to eat.

Afterward, we were driving south on Route D when I saw a green light crossing our front. After it crossed the road, I realized there were no other lights required by FAA regulations. In my lap was a camera loaded with color film. I told Mark to stop the car, but he coasted to a stop right behind some trees that masked the light, preventing an exposure.

The next night I was in Charleston. Five women had reported to me that the previous night, while they were driving south toward East Prairie, a light had settled down behind a local motorcycle shop along Route 105. In addition, the owner of the shop behind which the light appeared told me that his outdoor advertising sign had gone out during the night and that the next morning his clock was 18 minutes slow. The women confirmed that when they arrived at the shop, the advertising sign was dark.

I checked the area carefully and found no evidence of interaction with the environment. After dark, I set up some equipment at the farm home of Judy Greenwood, one of the five women involved. While she and her mother were with me in the yard, Judy and I saw a star high in the west that went out. It was among several similar stars, all of about the second magnitude. She told me that she had seen it too, but would not have mentioned it if I hadn't brought it up. She said she was afraid that I would think she was crazy, a response that is not unusual from persons who have seen a UFO.

Mark and I were not the only ones in our family to whom UFOs seemed to react. At 11:00 P.M., CDT, June 28, 1979, my wife went outside to close the windows of my Mustang parked in the street. Then she turned around and, while looking over the roof of the house, saw a bright light hovering in the sky. She thought the light, by her estimation much brighter than Vega, was a planet. In a few seconds, it moved slowly to the right and went out. She is not very familiar with the night sky. Hence, her situation differed from that of Mark's and mine: we would have known before the light moved that it was not a star or planet. By moving, the light attracted her attention—either a coincidence or a reaction to her gaze. But because she is not a member of the Project, her sighting is not included in our statistics.

If there is any doubt that the intelligence behind the UFOs recognized my presence, it was removed Wednesday evening, September 26, 1979. Mark and I were tossing a football in the back yard. When he and I finished at 7:45, I walked toward the patio, where Ruth and our daughters, Jane and Sarah, were sitting. I looked up. Hovering in the sky was a very bright white light that reminded me of Venus, but Venus wasn't visible. I hadn't seen a UFO for a long time and was trying to rationalize the sighting. When Mark reached me, I elbowed him in the side, saying, "Son, how do you like Venus sitting up there?" He looked up and shuddered, for he too knew that Venus was not visible.

Then, at the instant I told Ruth to go into the house to get my

binoculars, the light dimmed and began to move directly away from us. It dimmed and brightened three times as it moved. Mark ran inside to get the 800-mm lens camera system. When I got the binoculars, I examined the now-distant light but could see no structure. Jane brought my Olympus OM-1 camera on a tripod. Mark and I made exposures, but when developed, none showed the light. In the distance, it had diminished in brightness and did not contrast well with the sky. The light's path of departure suggested to me that it may have passed directly overhead to reach the point where we first saw it hovering.

The last sightings of 1979, and the last to be reported in this book, were on Friday, November 9. I was driving home from the University and turned on Westridge Drive. Topping the small hill, I saw a flash of xenon-colored light straight ahead under a heavy overcast. The time was 5:15 and daylight prevailed. At the moment, I didn't count the flash as a UFO because, I reasoned, the flash could have been internal to my eye, an entoptic effect due to a minute lack of oxygen in the retina.⁴ Five seconds later, a second flash occurred. Now, I knew for sure I was seeing real light flashes even though no material object was visible in daylight to create them. I guessed that the flashes were no more than a mile away.

These two sightings ended the seven-year period beginning that first night on Pyle's Mountain when Ueleke and I had five sightings of a hovering light. Even now, I wonder when and under what conditions the next UFO sighting will occur. I wait . . . and I watch.

NOTES

1. John W. Wilson, "Analysis of Soil Samples Collected at a Reported UFO Landing Site in Southeast Missouri," *Project Report*, March 1976.
Wilson, "Continued Analysis of Soil Samples Collected at a Reported UFO Landing Site in Southeast Missouri," *Project Report*, July 1978.
2. Ted Phillips, *Physical Traces Associated with UFO Sightings* (Northfield, Ill.: The Center for UFO Studies, 1975), p. 125.
3. Charles A. Dvorak, "Retinal Signals and Noise Underlying Visual Detection," *News Release*, American Institute of Physics, New York, October 12, 1979.
4. Suzanne P. McKee, "Visual Detection of Differences in Velocity," *News Release*, American Institute of Physics, New York, November 1, 1978.
4. John H. Taylor, Letters, *Physics Today* (October 1975), p. 11.

18

PROJECT SUMMARY: A FINAL REPORT

Up to this point, many individual sightings have been described; several have been analyzed. This chapter undertakes a summary of the data, to look for trends, to search for patterns, and to see if the intelligence behind the UFOs, be it human or otherwise, has left a message to be deciphered. By looking at the physical properties of the UFOs, perhaps a better understanding of the phenomenon will result.

Let us look at the scope of the Project over the seven-year period, 1973 to 1980. A total of 158 viewing stations were set up, during which the sky was watched for 427 hours, an average of 2.70 hours per station. Of the 620 observers on watch, 378 were Project observers.

We defined an "observer" as any person looking at the sky for UFOs, without regard to identification of the person. If an individual was present three nights at a particular location, he would have been counted as three observers at that location. If a friend came along for two of those nights, there would have been five observers involving two persons. If the first individual was a Project member, then there were three Project observers at the location and two observers or spectators.

Of course, a particular Project member was counted each night on watch. For example, I was on station 137 nights; 230 other

Project observers were on station; and 253 spectators watched with us. The total number of observer-hours was 1,919 while the members of the Project spent a total of 1,161 observer-hours on watch. Not included are the many hours Project members individually checked the sky when not at a setup.

In the Project, there were a total of 157 sightings of 178 UFOs, of which there were 34 Class A sightings of 45 UFOs. Obviously, some sightings were of the multiple-UFO type, the extreme example being the ten lights I observed through binoculars from an aircraft near Piedmont on May 11, 1973. In fact, there were 11 multiple-UFO sightings for which 33 UFOs were observed.

It would be presumptuous of me to claim that every one of the 157 sightings involved bona fide UFOs. Hence, I have carefully selected 40 Class B sightings of 42 UFOs, all seen during darkness, as possible aircraft or helicopters. We could not identify them, of course, although in our opinion, we should have been able to. Because jets—excluding four Harriers at McDonnell Douglas in St. Louis—do not hover, 12 of the sightings (14 UFOs) are categorized as possible helicopters. A request to the Army, Air Force, and state National Guard units to identify any of these sightings as their vehicles has been made. Unless all flight records are kept on file, identification is impossible.

Missouri and Iowa are well known for the high occurrence of UFO sightings. Certainly after 1973, southeast Missouri should be well remembered. Project observations were made from three major geographical areas: Cape Girardeau, Piedmont, and Farmington, though UFOs were observed also from viewing stations at Perryville and Sikeston (Fig. 18.1). A sighting by a Project member from an aircraft near Los Angeles is included too. UFOs are frequently seen throughout the Mississippi River valley, with possibly higher concentration in the southeast Missouri-southern Illinois region. Often I am asked, "Why the southeast Missouri area?" Many suggestions have been made to me to answer that question: (1) the affinity of UFOs for the New Madrid earthquake fault, (2) the availability of certain minerals in Missouri, and (3) the many lakes and rivers.

Another suggestion I might make is that the FAA radar coverage is poor in southeast Missouri; in fact, it is the worst along a line joining Cape Girardeau with Piedmont, with no coverage at all by FAA radar below 7,000 feet. This is the dividing line of responsibility between the FAA Memphis Air Traffic Control Center (antenna at Nashville) and the FAA Kansas City Air Traffic Control Center (antenna at St. Louis). Apparently, the military radar at

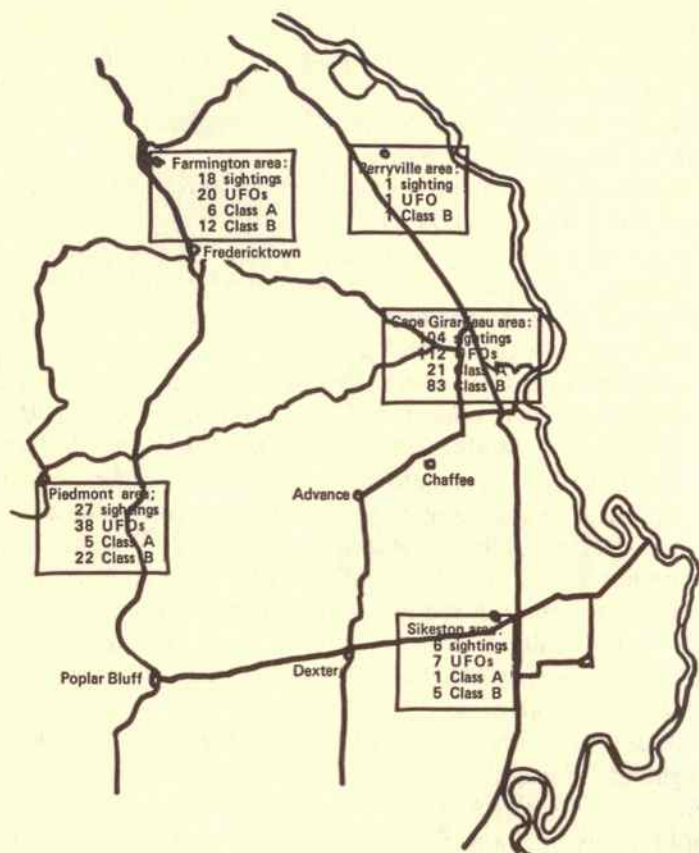


Fig. 18-1

Blytheville AFB covers the airspace at Piedmont above 2,000 feet.

Some persons suggest that UFOs are prevalent in southeast Missouri because they are based here! Remember the diver's search into Clearwater Lake in 1973? Then, Dennis Hovis told me that an airlines pilot saw three lights rise out of the man-made reservoir atop Taum Sauk Mountain near Ironton.

I can think of at least three other explanations. One is that UFOs don't really exist continuously in our space-time domain—a rather heady concept that some ufologists give serious consideration.¹ A second explanation is that they come here from other worlds (this galaxy? any galaxy? a parallel universe?) in huge “mother ships” that remain outside the earth's atmosphere, dispatching smaller craft to reconnoiter the earth.

Perhaps these smaller ships are themselves secondary

"mother ships." Persons have reported to me that craft come into southeast Missouri skies at night to disgorge four or five little discs, which leave for a couple of hours to scout the area. Meanwhile, "mama" hovers high in the sky, pretending to be a star until her "babies" return. After gathering her brood, the mother ship departs quickly, sometimes in the "wink of an eye." In this way, the UFOs can be very elusive, hitting whatever geographical area they choose, even causing minor UFO flaps lasting several nights.

Another possibility is that the phenomenon is man-made and might originate in St. Louis—say McDonnell Douglas, which does test aircraft and equipment over southeastern Missouri and southern Illinois. With lighting and proper maneuvers, several helicopters could create the illusion of the "mother ship" unloading. But for what purpose? Besides, the argument is vitiated because all helicopters are limited to speeds under 500 miles per hour and the lights discharged from the "mother ship" travel considerably faster than that, often appearing as just a blur.² But for the sake of argument, assume that a secret man-made craft can travel this fast at low altitude without making sound. Then, the frequent north-south paths and the turning around at Williamsville seem to suggest a source near St. Louis.

The Ozark region has been an area of occurrence of extraordinary events well before 1973. Ghost stories and spook tales date back a century or more.³ There could be some connection to the UFO phenomenon. Apparently UFOs were seen in the region prior to World War II. During a telephone inquiry I made concerning the use of the Forestry Service fire towers, a high official in a Missouri state agency volunteered the information that he had chased a flying disc while flying his private aircraft near Van Buren in 1937.

To continue the search for a pattern, we examined the number of sightings by the year, limited at first to those sightings during nights we were set up. Then, accidental sightings were included. The data are shown in Table VII. The data are sufficient only for 1973 and 1974. In those two years, the number of nights for which there were sightings average about half the nights set up. To be more detailed, in 1973, the average number of sightings per night set up was 1.02 compared to 0.69 for 1974. That is, in 1973, there were more nights of more than one sighting than in 1974. Because there was an average of one UFO sighting per night in 1973 and because the average number of hours on watch per night that year was 3.08, the average time interval between sightings was about three hours.

TABLE VII SIGHTINGS BY YEAR

Year	Sightings S on Nights Set Up	Number of Accidental Sightings	Number of Nights N Set Up	Nights Set Up M With Sightings
1973	96	10	94	44
1974	23	3	30	16
1975	1	1	5	1
1976	0	7	0	0
1977	0	6	0	0
1978	2	3	10	2
1979	<u>2</u>	<u>3</u>	<u>2</u>	<u>2</u>
	124	33	141	65

Thirty-three accidental sightings occurred when we were not on location in a field setup, constituting 21 percent of the total 157 Project sightings. Five of these occurred on the same date as a field setup for which we also had sightings. One accidental sighting was at dawn and another at midmorning.

Next, the number of sightings per month is examined for the first year (April 6, 1973, to April 6, 1974) of the field study. Including accidental sightings for this period, there were 115 sightings during 104 nights set up, for which there were 121 viewing stations, counting five aircraft searches on five different nights. The number of sightings per month is shown in the histogram (Fig. 18.2).

The maximum number of sightings occurred in May 1973, the month that we spent two full weeks in the field at Piedmont and at Farmington. In just three nights at Farmington, there were an unprecedented eighteen sightings. The sightings per month decreased until October, when a slight rise in the number of sightings coincided with the nationwide flap. Surprisingly, there were almost as many sightings in December, and January 1974, as in October.

The "success ratio" is defined as the number of sightings S per night set up divided by the total number of nights set up, N . These ratios are listed in Table VIII. The success ratio for May was a high 1.75, far greater than for any other month.

The number of sightings per month can also be found from studies of lay reports in the UFO literature.⁴ Most studies show that UFOs are seen more in late spring and again in early fall. The major criticism of these studies is that they are not normalized; that is, only

TABLE VIII SUCCESS RATIOS FROM APRIL 6, 1973, TO APRIL 6, 1974
(Accidental sightings are included in S; only nights set up are included in N.)

Month	Sightings Per Night Set Up: S/N	Month	Sightings Per Night Set Up: S/N
April	1:57	October	1.43
May	1.75	November	0.75
June	1.16	December	0.71
July	0.68	January (1974)	1.00
August	0.63	February (1974)	1.50
September	0.40	March (1974)	0.67

the number of sightings are totaled. Other factors could affect the data.

When the sightings per day of the week are studied, surprising results are obtained. The sightings for the first 12 months are listed by the day of the week, along with the number of nights set up (Table IX).

TABLE IX SIGHTINGS BY THE DAY OF THE WEEK
(April 6, 1973 to April 6, 1974)

(Numbers in parentheses represent those after the 40 Class B sightings that may have been jets or helicopters are subtracted.)

Day of the Week	No. of Sightings, S	No. of Nights Set Up, N	Success Ratio: S/N
S, Sunday	10 (4)	16	0.63 (0.25)
M, Monday	9 (0)	11	0.82 (0.00)
T, Tuesday	15 (12)	16	0.93 (0.75)
W, Wednesday	9 (6)	11	0.82 (0.55)
Th, Thursday	29 (22)	13	2.23 (1.69)
F, Friday	28 (24)	21	1.33 (1.14)
Sa, Saturday	10 (4)	20	0.50 (0.20)

The success ratios show that more sightings were seen per night setup on Thursday night than any other night. However, the success ratio for Thursdays is inflated by the total of ten sightings at

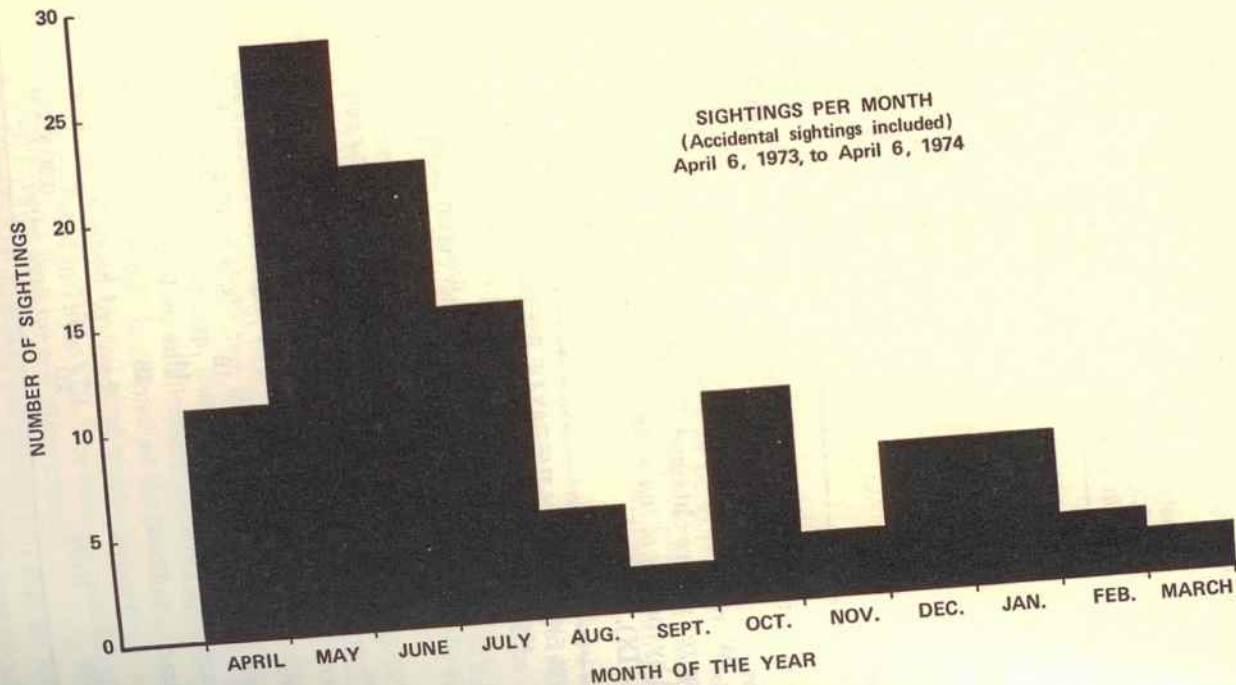


Fig. 18-2

Farmington on May 24 and May 31, 1973. By the same reasoning, the relatively large value of success ratio for Friday nights results from a total of seventeen sightings at Piedmont and Farmington on the nights of April 6 (5 sightings), April 13 (4 sightings), and May 25 (8 sightings). The success ratio for Thursdays is 3.5 times that for Sundays. The data show poor success on weekends, a result agreeing with most studies.⁵ However, the peak on Thursday does not agree with other studies where the peak night is Tuesday or Wednesday.

When we subtract the 40 Class B sightings I have selected as possible sightings of jets or helicopters that we couldn't identify, the changes are significant for Saturday, Sunday, and Monday nights, the latter dropping to zero sightings. This result, then, suggests more activity with conventional man-made craft on these three nights than the other four nights. National Guard helicopter units are stationed at Jefferson City and Springfield, Missouri. An Army Reserve unit is stationed at Scott Air Force Base, Illinois, and there is a large Army unit at Fort Campbell, Kentucky. In 1973, there were five or six helicopters at Fort Leonard Wood, Missouri. Most of these helicopters are types UH-1 and OH-58, having turbine engines. The National Guard units have special nights for training; for the Jefferson City unit, these are Tuesdays and Fridays.

Of the 157 Project sightings, the clock times for 141 sightings were recorded. In Fig. 18.3 the number of sightings for each half-hour interval are plotted versus the clock times. All times are reduced to Central Standard Time (CST). In Fig. 15.3, for example, the rectangle labeled 7:00 P.M. includes all sightings from 7:00 to 7:29 P.M. The histogram shows a preponderance of sightings between 7:00 and 10:00 P.M. In fact, 78 percent of the 141 sightings lie in this range. The precipitate decrease in the number of sightings after the 9:30 interval is apparent. Other studies give similar results.⁶

As suggested in other studies, more people are available to see UFOs during the evening. Most people are working during the day, and late in the evening they retire. Similarly, we in the Project were in operation mostly from 7:30 to 10:30 P.M. Naturally, we had more sightings during those hours when we were on watch. Hence, to determine whether UFOs are more ubiquitous during the evening hours, the number of sightings for each half-hour interval versus the number of viewing stations in operation during that interval is calculated (Table X).

The data tell us that the possibility of having a UFO sighting is greatest just before 7:30 P.M., CST.

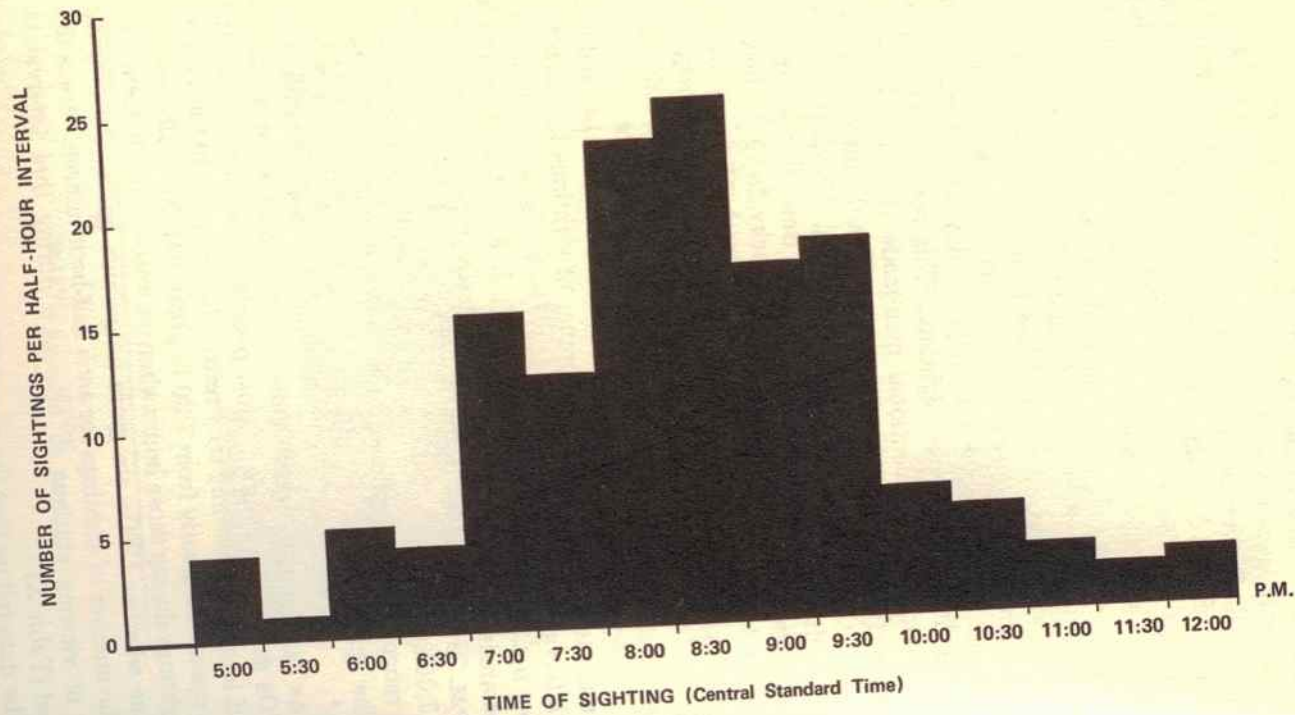


Fig. 18-3

TABLE X SUCCESS RATIOS BY THE HALF-HOUR INTERVAL (1973-1980)

(Numbers in parentheses represent those after subtracting the 40 Class B sightings that may have been jets or helicopters.)

Time (CST)	Sightings, S	Viewing Stations, V	Ratio: S/V
5:00	4	0	—
5:30	1	3	0.33
6:00	5 (4)	6	0.83 (0.67)
6:30	4	10	0.40
7:00	15 (11)	21	0.71 (0.52)
7:30	12 (11)	40	0.30 (0.28)
8:00	23 (17)	73	0.32 (0.23)
8:30	25 (19)	80	0.32 (0.24)
9:00	17 (9)	82	0.21 (0.11)
9:30	18 (9)	74	0.24 (0.12)
10:00	6 (3)	64	0.09 (0.05)
10:30	5 (4)	45	0.11 (0.09)

Because of the large variation in the time of sunset during the period of a year, more important than the clock times of sightings, I suspect, is the relationship of UFO sightings to the onset of twilight and darkness. During our field work, many sightings occurred well before dark, even under lighting conditions sufficient to discern the shape of an object.

To test the hypothesis that UFO activity shows a marked increase during the twilight period, rather than after dark, sightings during the twilight period were counted. Twilight is the period of time from astronomical sunset to dark, ranging through a minimum duration of 1 hour 26 minutes to a maximum duration of 1 hour 54 minutes through a year at our northern latitude of 37° , the approximate latitude of Piedmont, Cape Girardeau, and Farmington. The times of sunset and the end of twilight for each day of the year can be obtained from various sources.⁷

The scheme is to divide the sighting times into four categories: daylight, twilight (first half), dusk (last half of twilight), and night. I have arbitrarily divided the astronomical twilight period into two equal time durations by dividing $T-S$ by two, where T is the clock time at the end of twilight and S is the clock time of sunset, i.e., when twilight begins. The data are shown in Table XI.

TABLE XI SIGHTINGS DURING DAYLIGHT, TWILIGHT, DUSK, AND NIGHT (1973-1980)

Period	Sightings	Sightings (judgment)
Daylight	12	17
Twilight	13	—
Dusk	45	15
Night	<u>83</u>	<u>125</u>
	153	157*

*Four sightings were night sightings for which the time was not recorded.

As stated, the purpose of this analysis was to determine if the majority of sightings occurred just before dark. The tabulations in the left column of figures show that 25 sightings occurred during the period of illumination for which an object could be discerned; and a total of 70 sightings occurred before dark. The latter figure is about 46 percent of the total number of sightings. If the 40 Class B sightings after dark are subtracted, only 43 sightings of 83 remain.

There is another subjective way of determining how many sightings occurred under conditions for which the shape of the object could be discerned. In this analysis, I relied largely on experience and judgment to make the classifications. Only three classifications are made: (1) sightings that occurred before the brightest stars were seen in the night sky are called "daylight" sightings; (2) sightings from that time until dark are called "dusk" sightings; and (3) the rest are "night" sightings. For example, the May 11, 1973, sighting of ten UFO lights from an aircraft near Piedmont was under conditions of ample light to illuminate an object in the sky. But by definition of twilight used in column 1 of Table XI, this is listed as a twilight sighting rather than a daylight sighting. By using the appearance of the bright stars as a criterion in assigning daylight and dusk sightings, seventeen daylight sightings (11 percent) are counted.

The data show that sightings are more prevalent around sun-down. Then, too, fewer misidentifications of man-made objects are made by Project observers before dark than after.

Data on the initial compass direction (azimuth) to each of the 178 UFOs proved interesting. UFOs for which the initial compass direction was NNW or NNE are included with those UFOs whose initial compass direction was north; likewise the directions ENE and ESE are combined with east; SSE and SSW are combined with

south; and WSW and WNW are combined with west. On the other hand, each of the numbers of initial azimuths for NE, SE, SW, and NW is not combined with numbers of sightings in any other direction. (Obviously, any one of the four major compass directions will exhibit relatively larger values by this counting procedure because three directions are included under the label of one major compass direction.) The data are represented in Fig. 18.4.

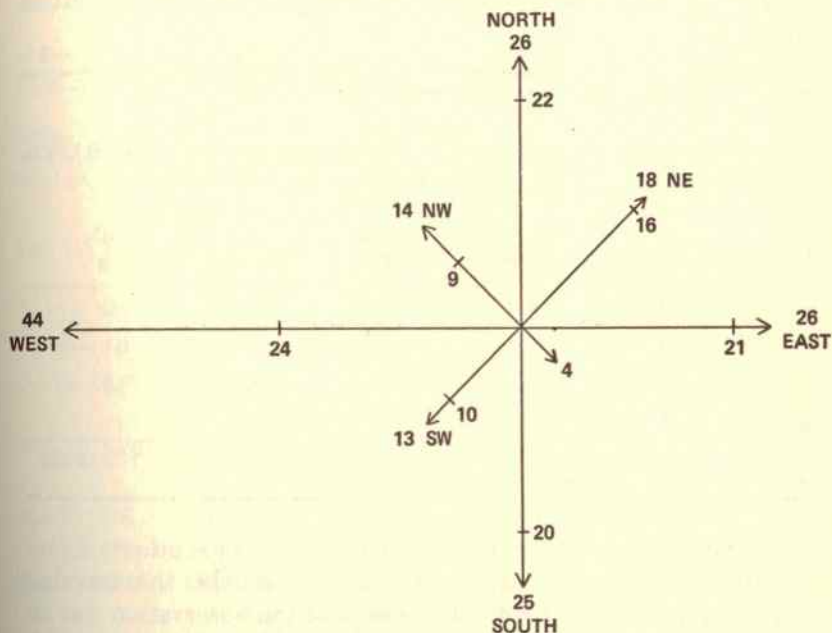


Fig. 18-4

Two thirds of the hours spent in the field were in the Cape Girardeau area, and these were the locations from which most of the UFOs were seen initially in the west—one explanation for the preponderance of sightings in the west. Of the 42 UFOs (40 sightings) that may have been jets or helicopters that we could not identify, 20 were seen initially in the west. Subtracting 20 from 44 leaves 24 UFOs seen initially in the west. The other adjusted values are south (20), east (21), and north (22) for the major compass directions and southwest (10), southeast (4), northeast (16), and northwest (9).

With this modification, the values of initial direction to a UFO are evenly distributed, except for the direction SE, for which only four UFOs were seen initially. Two of these were seen from my front yard. Presumably, UFOs would not likely be seen in the SE from my yard, because the heart of the city lies in that direction. Neverthe-

less, the SE direction should not have been disfavored while we were set up at other viewing locations.

Two UFOs were so nearly overhead that no compass direction was assigned; they are labeled *Up*. Similarly, six UFOs were observed from an aircraft in an initial position labeled *Down*.

Of more interest is the initial direction of motion of the UFOs. As was done for the data pertaining to the initial directions to the UFOs, the data are categorized into eight compass directions (Table XII).

TABLE XII INITIAL DIRECTION OF MOTION OF UFOs (1973-1980)

(Figures in parentheses are the values after subtracting the 42 Class B UFOs that may have been jets or helicopters but could not be identified.)

Direction	No. of UFOs	Direction	No. of UFOs	Direction	No. of UFOs
N	30 (12)	NE	15 (14)	Ground	8
S	28 (13)	SE	6	Hover	51 (44)
E	9 (8)	NW	7	Not Assigned	14
W	7	SW	3		
				Total:	178 UFOs

Note that 58 UFOs traveled in a northerly or southerly direction, while 15 UFOs moved NE, more than the number that traveled east or west. For 14 UFOs, the duration of the observation was so short that the direction of motion, if any, could not be ascertained; these UFOs were not assigned a category. Nevertheless, 6 observations of the RFEX are counted as hovering, because the effect was localized and did not appear to be moving during the three or four seconds the flashes were visible.

Although UFOs are often reported as hovering, the large number of hovering UFOs (51) seen by Project members is quite striking. In addition, eight other UFOs hovered near the ground and could (or should) be included in the hover category. These 59 UFOs constitute 33 percent of the 178 UFOs seen.

Taking into account the 42 UFOs that may have been jets or helicopters with regard to the initial direction of motion, only the values for the north and south directions are affected appreciably, being reduced to less than one half their original values in Table XII.

Because the two jet airways, J-35 and J-71, run essentially north-south, perhaps these results adduce further evidence that a

number of man-made craft were counted as Class B UFOs. Most of the 42 UFOs seen near a jet airway were near J-35 (west of Advance) rather than J-71 (east of Cape Girardeau). Nevertheless, of the 178 UFOs counted, 136 UFOs did not suggest a jet or helicopter.

People have been fascinated by the wide variety of UFO craft reported. Project members saw seven different shapes of objects, three of which made sound. Of the seven craft listed in Table XIII, I saw them all.

TABLE XIII UFO CRAFT (1973-1980)

Date	Place	Description
May 24, 1973	Farmington	Silent craft with white, red, red, white lights on the trailing edge.
May 25, 1973	Farmington	Triangle of red lights with aqua-blue light on the right side; small-engine sound.
Jun 19, 1973	Front yard	Bullet-shaped object in daylight changed color from gray to olive green; object vanished.
Jul 10, 1973	Front yard	"Jet" with serrated wings and uneven light distribution on the lower surface; jet sound.
Aug 10, 1973	Illinois	Rotating beacon on aircraft changed to JSLX; aircraft made the sound of a piston engine.
Jan 3, 1975	Westridge Dr.	Fluorescent disc flew over next block; it had a yellow light at the top of the dome.
Sep 5, 1976	Univ. office	Daylight disc shot upward, fading out in about two to three degrees of motion.

The classical semiconvex disc, most often reported in the UFO literature, was seen twice. Although we never observed a cigar-shaped object (the second most frequently reported), I did see a bullet-shaped object that could be considered a subclass of the cigar shape. The bullet shape itself is rarely reported in the UFO literature.

The triangle-shaped object is frequently reported too. Perhaps, the "flying wing" observed on May 24, 1973, at Farmington was a triangular-shaped object, as well as the triangle of red lights seen the next night from the Billedo farm.

To a physicist, one of the most fascinating aspects of UFOs is the dynamics of their motion. Their ability to hover silently is mysterious, even disconcerting to those who experience it. Our photographs of the light that hovered southeast of the Farmington airport

on May 24, 1973, show that there was some motion during the hovering process (see Plates 9 and 10). The motion could be that of a hovering helicopter. On the other hand, a back-and-forth jittery motion has been suggested by interpretation of radar returns from a hovering target. When the UFO stopped to hover, as observed on the radarscope, operators switched over to a mode called MTI (moving target indication)—a standard feature on search and surveillance radars, MTI eliminates returns from motionless objects such as hills, buildings, or a stationary helicopter. Hence, any return on the radar screen from a target when MTI is in use means the target is in motion. The return on the radarscope persisted, indicating motion, despite the fact that the return while the radar was in its original mode was that of a motionless object. Radar operators postulated that the hovering UFO was executing a jittery motion.⁸ In Plate 9, a slow drift of the light is evident. The same is true for Plate 10, except that either the drift speed changed or the light itself changed in brightness.

Some of our observations, where a hovering light subsequently shot across the sky, certainly eliminate a helicopter as the vehicle. Many of the lights we saw may not have been attached to a solid craft, but the disc I saw from my University office appeared to be solid material.

Theoretical explanations of how a craft can hover silently usually invoke some kind of gravity shield or antigravity device.⁹ No one has explained—publicly at least—the technology to build these devices. This type of research, however, has been well funded for many years by government organizations such as the Air Force.¹⁰

Another amazing, almost unbelievable, aspect of UFOs is their travel through the lower atmosphere at thousands of miles per hour. When a material object, like a jet, moves through the air faster than the sound waves that it produces, a sonic boom occurs. (A similar phenomenon occurs when a motor boat cuts through the water; i.e., the boat travels faster than the waves it produces.) The speed of sound at sea level is about 760 miles per hour while at 30,000 feet (about 6 miles) it decreases to about 670 miles per hour. Yet UFOs produce no sonic boom, and they do not burn up.

To date, the best explanation for the elimination of sonic boom is that the vehicle traveling at supersonic speeds could modify the airstream around itself by producing an electromagnetic field to ionize the air in front of it.¹¹ Energy to generate the electromagnetic radiation would originate from within the craft. This ionization may be the cause of the interference with television sets reported in southeast Missouri in early 1973. Presumably, a similar mechanism

of microwave emission from the craft's surface would lower its atmospheric friction and diminish heating.

In 1977, NASA designers were still concerned with the problem of surface friction. The boundary layer of air next to the surface of a craft is turbulent, creating drag, and heating up at very high speeds. In an attempt to afford laminar (smooth) flow of air over the surface of the craft, NASA scientists attempted to remove the boundary layer of turbulent air by suction, by drawing it through porous aircraft surfaces by lightweight pumps.¹²

Microwaves have been suggested not only as a means of propulsion but also as an interactant with humans and animals.¹³ Dogs have become extremely frightened in the presence of a UFO: recall the night of October 2, 1973, in a soybean field north of Sikeston where a German shepherd cowered in fear. At the time, I suspected ultrasonic sound (of a frequency above 20,000 Hz) which can be heard by a dog but not a human. Later, I learned that ultrasonic sound is highly absorbed by air molecules; in fact, the higher the sound frequency, the greater the absorption.¹⁴ To be sure, this information caused us to abandon our efforts to obtain a field portable ultrasound detector in favor of taking one of Bob Adams's dogs with us. Others in southeast Missouri have told me of reactions of dogs to UFOs, and this phenomenon is recorded regularly in the UFO literature.

Another incredible aspect of UFO motion is the observation of quick starts, instantaneous stops, sharp turns, and many other aerial performances beyond the limit of our known technology. These can all be termed "changes of motion" or acceleration. UFOs often achieve very high speeds in a fraction of a second; i.e., they exhibit large values of acceleration. (See footnote, chapter 12.) In essence, Newton's Second Law of Motion states that instantaneous starts, stops, and turns are forbidden for objects having mass—and objects *do* have mass.

Of the 164 UFOs that initially were in motion or hovering, 40 changed their state of motion—accelerated. Data are tabulated in Table XIV.

To qualify as a *Start*, a UFO must have been in a hover position initially. Nine of the 11 cases were of this type; the other two UFOs were lights that originated as streaks at some point in the sky at very low altitude. They were not meteors. The one case of *Speed up* occurred on June 4, 1973, at Nash Road. Four UFOs followed a *Curved path*. An even dozen changed direction by 45° while 7 made 90° turns. (In one case, a pseudosatellite made an apparently instantaneous right-angle turn in the handle of the Big Dipper.) Two of

TABLE XIV CHANGE OF MOTION OF UFOs (April 6, 1973 to January 1, 1980)

Category	No. of UFOs	Category	No. of UFOs
<i>Start</i>	11	45° turn	12
<i>Stop</i>	0	90° turn	7
<i>Slow up</i>	0	180° turn	3
<i>Speed up</i>	1	Upward	2
<i>Curved path</i>	4	Downward	0
		Total:	40

the 180° turns occurred on the same night about one hour apart, observed from my front yard on July 26, 1973. Two UFOs shot *Upward*: the first was observed from an airplane at Piedmont on April 12, 1973, the second from my University office on September 5, 1976. My observation of the apparent instantaneous right-angle turn in the Dipper handle had really perplexed me; it wasn't possible. Although I find the technology amazing, seeing the disc accelerate upward, three years later, reaffirmed my faith in Newton's Second Law of Motion: It suggested to me that the right-angle turn was not a square-corner turn but slightly rounded. If the light in the Dipper handle was an object having mass, the acceleration had to be large—but not infinite.

In all, there were 7 cases of *sharp turns* that took place in two seconds or less. This is a short time-interval for moving man-made vehicles to make a significant change in their direction of motion. For instance, the B-70, traveling at Mach 3, takes about 200 miles to make a 180° turn.¹⁵ But the B-70 is a large mass. A plasma ball, which has almost no mass, could make sharp turns, although some of the UFOs we observed making these turns appeared to be solid objects. One writer has suggested that in 1973, there were at least 430 different types of government craft that could make maneuvers similar to those of the UFOs.¹⁶ The question is: Did any of these fly in southeast Missouri? In summary, we saw 17 cases of unusual flight, 12 of which were Class A UFOs.

The tremendous burst of speed from a position of rest requires extraordinary force, and the energy needs for the larger vehicles are prohibited by our technological standards. "Kinetic energy" is proportional to the mass (weight) of the object and the speed of the object squared (speed \times speed). If the UFO itself is the source of its energy, then the energy is stored or generated in a

relatively small volume. Hence, the energy density is great, probably precluding chemical energy storage devices, which are relatively inefficient.

One can only guess at the propulsion mechanism. Again, one suggestion is electromagnetic radiation in the form of microwaves. Studies of electrostatic extraction of radioactive particles in air have led to the discovery that heavier-than-air craft can derive lift and propulsion from ionic emission. From this, a new lifting device, the "Ionocraft," was patented,¹⁷ but this does not provide the answer. Instead, an interaction of microwaves with the earth's gravitational field is suggested, a problem at the frontier of science. The theory by which electromagnetic radiation interacts with a gravitational field is esoteric and to my knowledge, remains just a theory. Nevertheless, many of the physical and physiological effects of UFOs reported by thousands of persons since World War II strongly suggest the presence of microwaves in the range of about 300 to 3000 MHz or higher.¹⁸ Alan Holt, astrophysicist training supervisor with NASA, has proposed an extension of the theory of radiation-gravitational field interaction.¹⁹ In what he calls the Field Resonance Propulsion System theory, he predicts tunneling through space-time; that is, the spacecraft could jump from this moment on earth to some place in space and time. It sounds a bit like the "space-warp" so dear to science-fiction writers, and to a few ufologists.

Observations of effects on the environment directly beneath the UFO suggest a field force, possibly gravitational. For example, waves of seawater peaked *toward* a UFO hovering 15 meters above the water surface.²⁰ Curiously, a secondhand story told to me about a farmer living south of Piedmont seems to corroborate the phenomenon. When the farmer surprised a disc-shaped object resting on his farm pond, the disc rose rapidly, taking all of the pond's water with it! Eventually, the water cascaded back down.

Another suggestion for using microwaves is to reduce the atmospheric pressure on a thin portion of one part of the craft, creating unbalanced forces.²¹ But this "electromagnetic atmospheric propulsion" wouldn't work in the near vacuum of space. Hence, if UFOs are physical craft of extraterrestrial origin, more than one method of propulsion is necessary—as suggested by a NASA engineer who devised the plans for a spaceship by scrutinizing the Book of Ezekiel in the Bible.²²

For decades, people have been reporting UFO colors ranging the entire visible spectrum from red to blue, as well as several kinds of metallic appearance.²³ Color may suggest the mechanism by which UFOs are propelled, by which they hover, and by which they move at

high speeds through the atmosphere without sonic boom or burnup.

The numbers of UFOs of various colors observed by Project members are summarized in Table XV. In every case, the color assigned is not a measured quantity, but a physiological assessment of the observer.

TABLE XV COLORS OF UFOs (1973-1980)

(Colors observed after a UFO changed color are not included. The figures in parentheses are the values after subtracting the number of Class B UFOs that may have been jets or helicopters that could not be identified.)

Color	No. of UFOs	Color	No. of UFOs
Gray	2	Amber	30 (20)
White	22 (15)	Orange	27 (21)
Off-white	54 (38)	Red	4 (3)
Yellow	4	Green	1
		Xenon	15

Assessment of adjacent colors like white and off-white is difficult, as well as amber and orange. Atmospheric haze always affects the color of white light by scattering the blue wavelengths. Our Project policy was: if the light was moving, to wait to assess the color until the light was closest to the observer.

Vehicles with multicolored lights are not listed in the table, although vehicles with double lights of the same color are counted. The first configuration of this type was observed from Nash Road on June 3, 1973. Few reds and greens were observed, but the blue-white color of excited xenon gas was seen on 15 occasions, manifested as RFEX, JSLX, and ERSX.

Four multicolored "vehicles" were observed. A huge, silent object with two red and two white lights flew over the Farmington airport on May 24, 1973. The next night, a triangle of red lights accompanied by a blue-green ball of light was observed from a field 2.3 miles east of the Farmington airport. An object with white and red lights and a flashing red light was seen from Vulcan fire tower on June 29, 1974, and a fluorescent disc with a yellow light on the dome passed over the next block from my home on January 3, 1975.

In the Project, five UFOs were observed to change color. The first color change was observed from Pyle's Mountain, on May 4, 1973, when occasional green and occasional red colors were observed in a receding white light. The effect, not as pronounced, was

seen again from the same location two weeks later when the receding light changed from white to off-white.

Acceleration and the corresponding color change were observed by several Project members from Nash Road on June 4, 1973. An orange light appeared to speed up, change to an off-white color, and brighten considerably. A color change during daylight was observed from my front yard in early June 1973 when a bullet-shaped object changed from gray to olive green. Yet, the most enigmatic change of all was observed from Illinois on August 10, 1973, when a white beacon light changed to a JSLX, a definite color change—and more.

Project observers saw many lights in the sky that came on, went off, pulsed, flashed, or changed in brightness. (See Table XVI.) In many cases, the light simply went out as if it was "switched off," while in other cases, the light vanished in about 1 second.

TABLE XVI PROPERTIES OF UFO LIGHTS (1973-1980)

(Figures in parentheses are the values after subtracting the number of Class B UFOs that may have been jets or helicopters but could not be identified.)

Function	No. of UFOs	Function	No. of UFOs
Off	50 (40)	Brightness change	32 (15)
On	5 (4)	Single flash	5
On-Off or Off-On	46 (49)	Single pulse	5
		Multiple flashes	4

The number of occasions (50) when lights were seen to go *off* is ten times the number (5) seen to go *on*. This is expected because the observer quickly notices a light, especially if it is moving, and will see it go *off*. On the other hand, the observer must be looking in the right direction to see a light come *on* in the first place. The 50 lights that went *off* are about equal to the 46 lights that went *off-on* (or *on-off*). Hence, the total number of lights observed to go *off* is 96; the number observed to go *on* is 51, the total of the lights seen to go *on* (5) and the 46 *off-on* (or *on-off*) lights.

In 32 cases, the brightness of a UFO varied. Most of these were actual brightness changes of the source itself and not scattering of light by haze or absorption by intervening clouds (although we observed these effects many times). Brightness change is not an unearthly phenomenon any more than a light turning *off* or *on*; but there has to be a reason for this.

Five single flashes of light were seen from the field, all but one by me. Two of the flashes were a red color while the other three were the color of a xenon strobe light. The duration of the light flashes was counted as 0.1 second; probably they were of shorter duration. In one case, the red flash was verified by a second observer (yard: June 1973).

The five single pulses were each of about one-second duration. Four of the five single pulses were seen in or near the "cup" of the Big Dipper. The five pulses constitute five sightings seen on four different dates and from three different viewing locations: Mudlick fire tower, Nash Road, and the yard. In four cases, the light pulsed several times in sequence. Most notable were the ten lights sighted from an aircraft flying near Piedmont on May 11, 1973.

The majority of Project sightings were lights, usually single or double. The double white light, seen in the winter of 1973, could have been carried by a small man-made craft violating FAA flight and lighting regulations. Could these have been two tiny RPVs (remotely piloted vehicles) from the McDonnell Douglas Astronautics Division in St. Louis? In the November 26, 1973, issue of *Aviation Week and Space Technology* there is a photograph of the McDonnell Douglas prototype, two of which had been flying for months. Powered by gasoline engines, mini-RPVs weigh less than 150 lbs., have wing-spans of about 10 feet, cruise at about 60 knots at 10,000 feet, and carry TV cameras and laser target designators. Their quiet flight and small size make them difficult to detect by radar, visual, acoustic, and infrared means.²⁴ Among the mini-RPVs are pilotless spinning discs "that hardly make a sound."²⁵ All three services have RPV vehicles, mini-size and larger.

The director of External Relations at the McDonnell Douglas Astronautics Company branch at Huntington Beach, California, assured me in a letter that the mini-RPV pictured in *Aviation Week and Space Technology* was developed in California and was "never demonstrated anywhere in Missouri." Now, of course, thousands of RPVs have been constructed since 1973 and, as one man wrote, are capable of "all the aerodynamic manoeuvres so frequently reported of UFOs—tight right-angle turns which could kill any living creature on board, sudden descents and ascents, and so on."²⁶ Apparently, these were not available in 1973.

To us in the Project, the orange light most typified the UFO. It had peculiar characteristics other than its color, appearing to "float" across the sky rather than being driven by a power source. Perhaps some visual clue gave us the feeling that it was not pushed

like a jet. The effect did not seem to be present for slow-moving white lights. True, some of the orange lights looked like plasma balls—unless the plasmas surrounded some small material object a few inches in diameter.²⁷ Depending on the relative dimensions of the object and the surrounding plasma, a two-frequency radar test may fail to determine whether a plasma contains a solid object.

In his book, *Ufology: New Insights from Science and Common Sense*, McCampbell suggests that microwaves are responsible for (1) stimulating colored halos around UFOs, largely stemming from the noble gases (neon and xenon gas, for example) in the atmosphere, and for (2) producing a dazzling white plasma on the surface of some UFOs. These suppositions would suffice to explain many of our sightings, but more important, they agreed with my first guess that the small plasma balls could be produced by microwaves. I thought of a method that might work, by analogy to a technique used in medicine where crossed beams of radiation have been used to deliver high concentrations of radiation where internal cancerous cells are located. By crossing well-defined microwave beams, it might be possible to produce a localized "hot spot" in the atmosphere.²⁸ But it would be nearly impossible to form the well-defined balls we observed, and difficult to move these balls of light across the sky at low altitudes.

Because I doubted the scheme just described would work, I looked for another radiation source with a smaller diameter beam—the infrared laser. (We could have seen laser beams of visible light; and laser emanations of even higher spectral energy would have been strongly absorbed by the air molecules.) Here again, the difficulty is in supplying sufficient continuous power to a laser beam. Another problem in keeping the beam well defined is a phenomenon known as "thermal blooming"; the beam spreads because it heats the atmosphere as it passes through it.²⁹ I consider these explanations for the plasma effect as very unlikely.

Another important Project discovery was the "scintillating star effect." Although many persons have described UFOs as star-like, few, if any, were aware that UFOs would hover in the distance flashing red, white, and green (the primary colors) *in sequence*, mixing relative amounts of each color to produce a scintillating star of the desired color and brightness to the naked eye. A faster sequence, because of the persistence of images on the retina, could give a steady color such as amber.

There has to be a reason for the UFO intelligence to resort to such chicanery—if that is the word. Even a helicopter could be

outfitted with lights to perform such a function, of course. But was this performance part of a continuing military maneuver—or was it for our benefit? If the scintillating stars were not man made, why did they hover in military jet lanes?

One case of a radar-visual sighting occurred in the fall of 1973 near Los Angeles. The target ceased to provide a radar return at Los Angeles Center, but remained visual to Drake Kambitch, the pilot of the aircraft. In another case, at Farmington on May 30, 1973, Drake and I saw in the sky a light that did not provide a return to Kansas City Center radar—while our aircraft did. In two jet-UFO chases, the jet's action suggested to Project observers on the ground that the target had ceased to reflect a radar signal. If Missouri Air National Guard jets were involved in the chase on June 4, 1973, then TAR (target acquisition radar) was not available on the near obsolete F-100 jets. The newer F-4 Phantom did have TAR, but—according to the commander of the 131st Tactical Fighter Wing, stationed at Lambert Field in St. Louis—the unit did not acquire the F-4 until January 1979. The aircraft that chased a light and performed a figure-eight search pattern on October 7, 1976, was identified as an F-4. In response to an inquiry I made to the deputy commander for Operations, Illinois Air National Guard, stationed at Capitol Airport, Springfield, he wrote that his unit acquired the F-4C in April 1972. According to the deputy commander, October 7, 1976, was a “stand down day,” i.e., no flying. As it stands now, I cannot locate the origin of the F-4 that lost the light visually—and seemed to have lost it on radar too.

Another important Project observation was that the reaction time of the UFOs was not instantaneous. In 32 cases of apparent reaction to the Project observer, the reaction time varied from an estimated one second to about one fifth of a second. The human visual system can detect time intervals as brief as 20/1000 to 50/1000 second, depending on the illumination.³⁰ Perhaps these relatively long reaction times suggest some kind of automatic feedback system in which the UFO intelligence does not participate—or in which it participates at the end of the chain of information, as would be the case if the UFO were “unmanned.” The plasma balls seen in daylight certainly suggest remote control.

In this research, more was involved than the measurement of physical properties of UFOs by dispassionate observers. A relationship, a cognizance, between us and the UFO intelligence evolved. A game was played. In my opinion, this additional consideration is more important than the measurements or establishing that the phenomenon exists. This facet of the UFO phenomenon perturbed

me as much as the advanced technology we observed. It is a facet I cannot really fathom—and I have thought about it every day for more than seven years.

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A VERY SUBTLE PHENOMENON

Unbiased, disinterested physical scientists usually measure the properties of inanimate matter. Biological, medical, and behavioral scientists, on the other hand, study intelligences less than or equal to their own. In this Project, we dealt with an intelligence equal to or greater than that of man. We interacted with the phenomenon under study.

Our 34 Class A sightings comprise our most consequential evidence for the existence of UFOs. A total of 70 other observers were present for 27 of the 34 sightings, although 16 of these persons did not perceive a sighting for a variety of reasons: lack of binoculars; an event that was transient, or difficult to see. At least nine other Project members observed Class A sightings; for example, Wilson saw 10 and Adams 5. I was present for 28 of these Class A sightings; for 7, I was alone. The types of the 34 Class A sightings are summarized in Table XVII.

The 34 Class A sightings involved 4 multiple-UFO sightings (16 UFOs) for a total of 46 UFOs. During the 5 sightings labeled "hover," for example, 14 UFOs were seen. Seven craft were observed, three of which made sound. (These are listed in Table XIII.)

Almost as astonishing as the 34 Class A sightings is the large number of sightings I have had from my yard—37. It seems as if the UFOs come into visual range of the yard simply to be seen! Ten of the 37 sightings were Class A, while 27 were Class B. There were 27 night sightings, 7 at dusk, and 3 daylight sightings. The total duration of 9 of the 10 Class A sightings from the yard was one

TABLE XVII TYPES OF CLASS A SIGHTINGS (1973-1980)

Lights	Motion	Other
6 RFEX	5 Streaks	7 Craft
3 JSLX	1 Inst. 90° turn	3 Sound
3 ERSX	5 Hover	11 Daylight
16 On-Off	5 Vanish	2 Twilight
5 Off		21 Night
2 On		

minute and 28 seconds, an average of 9.8 seconds per sighting; the tenth sighting lasted 6 minutes. Of 24 Class B sightings timed, 15 lasted a total of 62.2 seconds, an average of 4.1 seconds per sighting. The total duration for all 24 Class B sightings timed was 27 M 55.3 S, an average of 69.8 seconds per sighting. Obviously, UFOs don't remain long in the vicinity. Unless the equipment is already set up in the yard, the UFO is gone before equipment can be brought outside to bear on the sighting.

If we include the sightings from other locations within the city limits of Cape Girardeau, then 7 more sightings must be added, for a total of 44 sightings from the city. Including locations just outside the city limits (say, 500 feet east of the Mississippi River bridge in Illinois), 6 more sightings bring the total number of sightings to 50 from the immediate Cape Girardeau area. This figure does not include any sightings reported to me by other persons, nor the 60-70 sightings by my son Mark from the yard before he became 16 years old and qualified as a Project member.

During 20 of my sightings from the yard, others were with me; during 6 Class A and 11 Class B sightings, I was alone. There were 37 other observers involving 11 individuals, 9 of whom were related to me. Considering the immediate area of Cape Girardeau, the number of observers increases dramatically to about 45, representing about 30 individuals.

Early in the field research, I realized that events seemed to be related. But as an unbiased observer, I could not assume relationships between events without proof. But consider that I have identified 80 occasions which I have labeled coincidence! I could easily count another 20 cases.

Some believe that not all coincidences happen by chance but come about because of some undefined "force."¹ The famous Swiss

psychologist C. G. Jung proposed that psychic forces are at work, causing "synchronistic" relationships between events; that is, "acausal, meaningful coincidences."²

In my opinion, people read more into coincidence than is justified. For example, if the first 4 cards drawn from a deck of 52 cards were the aces, the event would be relatively rare—but no rarer than drawing any 4 *specified* cards; say, the deuce of hearts, the 8 of spades, the 9 of diamonds, and the jack of clubs. What we often consider a rare event really isn't; it is just as probable as any other outcome.

Consider some brief examples. On July 10, 1980, at a Brielle, New Jersey golf course, three persons in three independent four-somes shot a hole in one. Unusual! Four years had elapsed since any golfer playing this course had made a hole in one—and, as it turned out, two of the players were related.³ Then there was Captain Gene Hersche, a Continental Airlines pilot and Air Force flyer in World War II. On his last flight before retiring, two tires blew out on takeoff, causing an accident. In the ensuing fire, only two persons died in the evacuation.⁴ It was his first aviation-related accident!

In 1976, I had an experience that I must accept as pure coincidence. In February, I received a telephone call from a newsman in eastern Canada who believed that UFO investigators were mistaking "fairy rings"—circles of growing mushrooms—for UFO landing sites. Having never heard of fairy rings, I obtained a biology book to learn about them.⁵ Later in the spring, a well-defined circle of mushrooms grew on the lawn below my office window at the University.

This background material on coincidence is presented to help the reader in judging whether the 80–100 coincidences were really *all* coincidences—or whether many of them were planned events, intentional events by the intelligence behind the UFOs.

Thirty-two Project cases of apparent reaction or awareness have been counted, 14 Class A and 18 Class B sightings. On the second night I was at Piedmont, experiences suggested to me that the intelligence controlling the UFOs were aware of our presence, that the UFOs may have purposely attracted our attention, and that they may have reacted to us—although at the time I did not label the sightings as UFOs. It was April 12, 1973, when Drake Kambitch and I were flying in the vicinity of Piedmont after dark. A bright orange light appeared on Clark Mountain. Drake turned the aircraft to fly in the direction of the light. A few seconds later, the light went out; simultaneously, an identical light came on to our

right. To this point, there was a possible reaction to us and two possible coincidences. The third possible coincidence and second apparent reaction occurred when the light shot skyward as we approached.

How did the UFOs react to us? They turned lights off, on, moved away, shot away, changed course, changed brightness, and the like.

The types and numbers of stimuli for the 32 apparent reactions are: our vehicle (5), pointing or aiming (16), voice (2), radio signal (3), telepathy (2), and awareness (4). A few examples of each type, already discussed in detail throughout the book, are summarized.

Two of the vehicular cases involved automobiles: First, an orange light came across the valley at Dutchtown on June 5, 1973, and turned away from us to the northwest. Again at Dutchtown on June 19, 1973, Bob Adams and his son, Doug, saw an orange light excite a thunderstorm, approach their parked car, and turn to the northwest from a northeast course. Possibly, the latter stimulus could be classified as the aiming of a camera because Bob took an exposure just before the light swerved to the northwest.

Three vehicular stimuli involved aircraft. The April 12, 1973, sighting just described suggested 2 reactions, and the light in the constellation Gemini near Farmington on May 31, 1973, flew away as Drake and I approached in a Cessna 150. The radar-visual sighting by Drake near Los Angeles, and the sighting of 10 lights in the sky on May 11, 1973, were not counted as reactions, although they may have been.

Among the 16 cases of aiming are 1 case of pointing a flashlight, 3 cases of hand pointing, 4 cases of aiming a camera, and 8 cases of aiming binoculars or telescope. Some examples:

(1) On June 21, 1973, I pointed a flashlight at a seemingly stationary light low in the south-southwest. The light began to move, avoiding our viewing station on Blomeyer Road by curving to the northwest; (2) on June 20, 1976, I pointed my finger at a pseudostar near the star Vega while making a remark to my wife. The pseudostar went out. The reaction could also be classified as a voice response. (3) On July 26, 1973, a light approached my yard from a ridge to the northeast. As I cocked and aimed the camera, the light immediately reversed direction. About an hour later, the procedure was repeated. On May 25, 1973, in a field 5 miles east of the Farmington airport, a pseudostar moved away when the camera was aimed at it. On October 2, 1973, in a soybean field at Sikeston, three lighted

windows in a UFO went out as the camera was cocked and aimed. (4) On February 22, 1974, during two separate sightings, a pseudostar went out just as I found it in binoculars. The first of three lights to appear went out when I cocked the camera. On October 14, 1973, a pseudostar hovered near the star Capella. At the moment I observed the pseudostar in binoculars, it began to move away; (5) in the spring of 1974, I aimed a Celestron telescope at Venus, apparently causing a streak of light to originate at a point on line with the telescope and Venus.

Two cases of apparent voice reaction: On October 27, 1973, a light came over a ridge behind the Adams house. A group of Project members saw it from the Adams observatory. When I yelled, "Get the cameras!" the light "skidded" to a near stop, making a sharp turn toward the Cape airport. On September 26, 1979, a bright light hovering in the west began to move when I yelled at my wife to go into the house and get the binoculars. Both were daylight sightings.

The best evidence for reaction to a radio signal was the observation on May 30, 1973, at Millers High Point, when a pulsing light went out as I pressed the microphone button. Because the light went out before I spoke, the reaction, if any, was to the 37.1-MHz carrier wave and not to my voice or message. Why would the UFO react to the 37.1-MHz frequency over other radio signals unless it was tuned to that frequency? Radio operators in the Piedmont area experienced the same reaction at other times, but to carrier waves of different frequencies.

The second case of radio reaction occurred on January 24, 1974, when I used my CB radio to call Bob Adams driving ahead of me on Route 25 near Advance. A southbound light turned west, as if it had reacted to my message to Bob, not to the 27-MHz carrier wave. The third case involved the radar-visual sighting near Los Angeles in the fall of 1973. The Los Angeles Air Traffic Control Center radioed Drake about a target ahead of his aircraft. Immediately, the target disappeared from ATCC radar, but not from visual sight.

In only two cases is telepathy suggested. The first occurred on July 5, 1973, at the Cape Girardeau J.C. golf course. As an amber light moved across the sky, John Wilson and I checked it for undulating motion, finding none. As soon as we terminated our test, the light undulated. The second case occurred on November 17, 1977, when a pseudostar near Jupiter moved over and went out, as if reacting to my thoughts. A few other cases could have been classified as telepathic reactions rather than, say, clues given by voice or physical movement.

Four cases I have labeled "awareness" rather than "reaction." The first occurred when I observed the disc shoot upward from my office window on September 5, 1976. On the night of June 25, 1978, Mark experienced this awareness twice when he observed a pseudostar go out. A fourth case is again a pseudostar that went out while two women and I observed the sky from a farm home between Charleston and East Prairie.

Did UFOs really react to members of the Project? It is possible that a light could be flown on a course at low altitude—say 3,000 feet—and turned on for a while, then off, so that persons along its path within visual range would feel that the light had reacted to them. The principle would work even better if the light hovered. Having experienced 28 UFO reactions, I believe that the reactions were not *all* mere coincidences. I was there . . . and skeptical.

Even more *subtle* aspects of the UFO phenomenon were observed by Project members, although I experienced many of these aspects exclusively. One type of behavior evident to Project members was the avoidance paths flown by the UFOs. A UFO would approach as if it would pass overhead; then it would go around our position. The manner in which UFOs approached Pyle's Mountain was of this nature. Observations in the Cape area proved no exception, starting the night of June 4, 1973, when we were avoided twice. The following night a bright orange light approached our moving automobiles in daylight, then turned in an apparent avoidance path to disappear over a ridge at Dutchtown. Again, on June 19, at the same location, the similar avoidance path was repeated for Bob and Doug Adams.

On two nights, I observed a pair of lights flying north, one on each side of Cape Girardeau. On both nights, the light on the western side appeared first and failed to emerge from a line of trees in the back yards of homes across the street from my residence. Likewise, on both nights, the northbound light to the southeast disappeared behind the same maple sapling growing in my front yard. Perhaps these are coincidences, but few aircraft lights ever disappeared in the unobstructed portion of the view of the sky. In all the years of the Project, only one aircraft ever reacted to me by turning off its landing lights when I pointed to it—and I pointed at a few.

The light that approached my yard from over a nearby ridge and quickly receded when I cocked the camera was not quite as subtle—but it happened twice the same night.

Those of us who worked in the Project frequently sensed that we were dealing with an intelligence, and not only because of the apparent reactions of the UFOs. On one occasion, when we changed

position one night by moving our viewing station 10 miles farther west, the UFOs changed their flight path accordingly, to go around us, just as before. I predicted that they would fly around our western flank—and they did.

Another subtle coincidence took several months to develop. At one time in May 1973, at Piedmont, I awoke at about 1:00 A.M. to take my turn on watch. Immediately, I checked the sky. As I looked overhead, one star appeared to circle another without ever completing the circle. In a few moments, I knew I was experiencing autokinesis. When I looked away and looked up again, the effect persisted. Some three months later, when I saw a light circle a real star a couple of times and go out, I knew I wasn't experiencing autokinesis.

Not until we began field investigations at Cape Girardeau did I really begin to suspect that some sightings were staged for me, when I was alone—the first being the daylight sighting of the bullet-shaped object on June 19, 1973. Some of these sightings were of such short duration that either they had to be staged or I was extremely fortunate. Two examples were the pseudostar circling the real star and the sighting of the beam of light that made a fast 180° sweep. The case of the daylight disc seen from my office is an extreme example. Then, there were the pulses and flashes of light that were of very short duration. Also, I had many sightings while diligently sweeping the sky with binoculars. The question arises: Would these events have occurred had I not been looking in the direction of the event at the time of occurrence? Were events occurring in other directions as well? Many of the sightings occurred near prominent stars, planets, and constellations where, presumably, a person familiar with the sky would look. Was the location of these events accidental, or by design?

Others in the Project had numerous sightings when they were alone. Fortunately, there were many occasions where two or more members witnessed these events, and we were able to compare notes to establish that we were not "seeing things."

Another strange aspect of the investigation puzzles me: my apparent intuition regarding the presence of some UFOs. Even before I became more familiar with the constellations later in 1973, I seemed able to recognize pseudostars. At Farmington, for example, I suspected something was wrong because three stars made a vertical straight line; the lower "star" turned out to be a pseudostar. A week later, while flying in the Farmington area with Drake Kambitch, I suspected that a star in the constellation Gemini did not belong. It didn't. There were many other examples, especially where I would

ask Bob the identity of a particular star only to learn that it was a pseudostar. And there was the feeling of premonition during the daylight sighting of a ball that passed over my yard; or the appearance of a light in the west near Mars, when Mark and I were set up on the Blomeyer side road.

For two sightings, I have suggested the possibility of telepathy (on the part of the UFO intelligence), but this may not be the explanation. Possibly the UFOs were able to drift silently near our positions at night and listen to our conversations, or detect them at a distance. Often, we felt that the UFO intelligence knew our moves; for example, the night we moved 10 miles farther west. Of course, our own military was capable of surveillance with very advanced technology. A Viet Nam veteran told me, for example, that the military had an infrared laser device that could detect the white portion of the human eyeball. Of course, Robert Snider and I were several miles from any of the three hovering lights that apparently reacted to us while we were stationed at the Huffman farm the night of February 22, 1974. However, in the case of the pseudostar near Jupiter that moved over and went out, I gave no visual or oral clue that I knew the pseudostar was present; I was merely looking in that direction. After the sighting of the undulating light at the J.C. golf course on July 5, 1973, I felt as though something was toying with us.

I suspect that UFOs actually dart about in daylight at speeds at which they cannot be seen. I base this on a few cases of reflected sunlight and the circumstances of the disc that hovered within viewing range of my office. Possibly a great deal of UFO activity is subliminal—which, if true, could have serious ramifications.

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A HISTORICAL PERSPECTIVE

A Gallup poll taken in November 1973 indicated that 15 million adult Americans had seen UFOs, while 70 million adults "believed" in UFOs, leaving about 66 million who apparently were skeptical, agnostic, or just not interested.¹

The results of an opinion poll conducted by *Industrial Research/Development* magazine appear in the July 1979 issue. The article states that a large number of applied scientists and engineers believe in UFOs. Eighteen percent of the respondents thought that they had seen a UFO, although more than half were not sure. Most of those who had sighted UFOs had read up to five books on the subject. I suspect that they saw UFOs because they were more observant—they looked!—as a result of their interest in the UFO phenomenon, and because as a result of their familiarity with the subject, they were more cognizant of bona fide UFO sightings. The poll also showed that the older scientists and engineers, the ones holding higher degrees such as master's and Ph.D. degrees, do not accept UFOs as a reality. From my own experience, I concur with that statement.

Dr. Peter Sturrock of the Institute of Plasma Research, Stanford University, has found that scientists will report UFO sightings if their anonymity is guaranteed. He mailed UFO questionnaires to 2,611 members of the American Astronomical Society, of which 1,356 were returned. There were 62 respondents who had witnessed 65 events that they "could not identify and which they

thought might be related to the UFO phenomenon." Interestingly enough, 7 sightings of "disk-shaped objects" were reported.²

John Gilligan, governor of Ohio, reported a UFO in 1973, as did President Jimmy Carter when he was governor of Georgia. In an attempt to honor a campaign promise that he would remove government secrecy regarding UFOs, the President petitioned NASA to establish a UFO investigative group. NASA refused because of a lack of solid evidence such as "little green men," or a "piece of metal" from a UFO. Dave Williamson, NASA assistant for special projects, said "... it's not wise to do research on something that is not a measurable phenomenon. . . . A photograph is not a measurement." He ended with: "How do you prove something that does not exist?"³

Unless one has been in the field to study UFOs, one cannot really comprehend the phenomenon. Of some 700 Project photographs, for example, not one exposure of a Class A UFO was obtained from 32 Class A sightings. Either the UFO disappeared before it could be photographed, or it appeared when cameras could not be brought to bear—or, if exposures were made, nothing showed on the negative. Was this by design, or was this just a long series of coincidences?

Although our photographs were of Class B UFOs—a classification based upon visual observation in the field—a number of these photographs present serious enigmas, most of which are discussed in this book. During a visit to our university to lecture, Dr. Michael Zeilik, astronomer at the University of New Mexico, learned of the photographs and asked to see them. As I began to show them to him, explaining the enigma of each photograph, I sensed his distress. Then he squirmed and exclaimed, "But you can't see the horizon in these photographs!" Although he had not, as yet, seen those where the horizon did show, giving a point of reference, I couldn't resist saying, "Mike, the next time I see a UFO, I'll request that it fly a little lower!" He got my point.

Many scientists and writers remain skeptical about the existence of UFOs, evident from the suggestions they make regarding the cause of the phenomenon. A few of these include: (1) swarms of spruce budworms stimulated by large atmospheric electric fields to emit light in the form of St. Elmo's fire;⁴ (2) druglike visions triggered by an external source;⁵ (3) application of psychotronic technology (use of physical devices to affect human consciousness);⁶ (4) production by the solar wind;⁷ (5) remotely piloted vehicles;⁸ (6) objects originating in the sea;⁹ (7) psychic phenomena;¹⁰ (8) the

product of the Devil;¹¹ (9) creations of the media;¹² (10) CIA-sponsored;¹³ and (11) devices built by the Nazis.¹⁴

In addition, we have the suggestion that the UFO phenomenon is a worldwide misperception of meteorological phenomena (Menzel).¹⁵ On pages 142–43 of the book, *UFOs, A Scientific Debate*, Menzel lists 109 natural and man-made examples of UFOs. Omitting seven radar types—our radar set never arrived, so we couldn't be fooled by radar images—I have experienced 88 of 102 (86 percent) examples listed, plus a few not on the list.

Philip Klass, senior editor of *Aviation Week and Space Technology* magazine, has long been a proponent of the plasma theory of UFOs.¹⁶ Certainly Project members saw plasma-like balls both by day and by night. But I seriously doubt that plasma balls became detached from some power line, or that luminous gases rose out of some southeast Missouri swamp, or that "excited" globs of ammonia vapor floated out of some recently fertilized field to "fly" a straight course, centered over I-55. Klass says that lightning is a source of plasma balls, which is true. From my office at the University, I have seen a lightning bolt create small balls that looked like molten liquid, but we saw balls of light that looked like plasma in clear weather, too. When they went out in daylight, nothing could be seen.

The facts concerning UFOs are mostly secondhand and tenuous, making publication by skeptics difficult. Skeptics have attacked ufologists for not applying the scientific method more assiduously in the investigation of UFO sightings.¹⁷ From the skeptics, I have found the books by Menzel, Klass, and Condon to be of great value in our field research. From them, I have learned what natural and man-made phenomena to look for in avoiding pitfalls. Unfortunately, their views do not explain the majority of our Project sightings. Since the skeptics do not accept the existence of UFOs (certainly not the extraterrestrial variety), they are unaware, or choose to ignore, the subtleties of the UFO phenomena. UFOs *do* imitate natural and man-made phenomena; I've seen them do so. The skeptics are fooled by this; consequently, they often jump to conclusions and their biases are reinforced. Show me a man without bias, and I will show you a corpse.

To enhance our perspective on the role of the military in the UFO situation in southeast Missouri, I am certain that Missouri National Guard helicopters were flown in search of UFOs—unofficially, not by headquarters command. As an "educated guess," I suspect that Missouri Air National Guard jets, as well as those of the Air Force, were involved. UFOs have been a problem for the Air Force, at least until it closed down Project Bluebook in 1969 and

officially denied further interest in UFOs. Project Bluebook was a small office-type unit at Wright-Patterson AFB for the purpose of studying UFO reports and interrogating persons who had sighted them. The history of the USAF's effort to cope with the UFO problem is well documented in Major David Carlson's article (*Aerospace Historian*, December 1974) and the review book by Jacobs (*UFO Controversy in America*).

My first inkling of the presence of military craft at Piedmont came in March 1973, when Joe King, a resident of the Brushy Creek area, told me about an amber light that had come up the Black River Valley. From the opposite direction, with lights flashing, a helicopter approached. The amber light stopped and went off. Then, when the helicopter was well past, the amber light came back on and resumed its journey.

Mike Toney and Harry Willson, both University students in my classes and residents of Piedmont, told me that there was an unusual number of overflights by military aircraft during the first month or so of the UFO flap at Piedmont. Some flew lower than the surrounding mountaintops, so close that Toney and Willson could look down and see the pilots. The area, with terrain similar to that in Viet Nam, was used as a low-altitude test area. The McDonnell Douglas Astronautics Company (East), St. Louis, according to Senior Group Engineer W. W. Schramm, conducted radio altimeter systems performance tests at low altitudes over various types of terrain from a line north-to-south from Taum Sauk reservoir to Williamsville. One plane flew at 200-700 feet, while a second plane flew at 3,000 feet, photographing. These were done with company twin-engine light aircraft, flying daytime only. Hovis, on a newscast from KPWB, said the last flight was on March 19, 1973.

Hovis told me that the two Air Force men arrived in Piedmont to investigate UFOs, but he did not know if they were acting in an official capacity.

Our policy in Project Identification has been not to publicly berate the Air Force or any government agency for their handling of the UFO situation. To the contrary, on June 1, 1973, two days before the Project returned to Cape Girardeau from two weeks in the field at Piedmont, Jim Sage and I telephoned General Seth McKee at NORAD headquarters in Colorado Springs. We were referred to the UFO information officer, Colonel Bill Coleman. He was rather noncommittal until I described the JSLX seen at Fredericktown on May 24. His response was a long silence; the sighting seemed to have meaning to him. At the time, I didn't know of Coleman's close encounter with a disc while he was aboard an Air Force B-25. Later,

when he became involved with the television show, *Project UFO*, the encounter was reenacted in one of the episodes. Four nights after our telephone call to NORAD, we saw several military jets swarm into the Cape airport area during a UFO sighting.

In the fall of 1973, from our viewing stations on Nash Road and Blomeyer Road, we observed lights suddenly appear, moving north or south near Jet Airway J-35. When about due west of our position, these lights would invariably brighten. In some cases, when they went out, a telltale dim light, continuing in the path of the original light, could be discerned through a telescope or binoculars. By our standards, these were Class B sightings. We suspect that the brightening phenomenon was related to our presence. Maybe individual pilots were being "playful." Our viewing locations were not secret: I described them in public lectures, they were reported by the media, and we broadcast our activities on CB radio in the field.

During the fall of 1973, I received an anonymous letter from a woman living in Kansas City. She wrote that at age forty an aeronautical engineer, a relative, had retired to a region of northern Arkansas near the Missouri border along with some other engineers. As far as she could determine, he had no visible means of support. This seemed to tie in with information Bob Adams had gotten from an acquaintance that there were underground installations in southern Missouri. Allegedly, their entrances were guarded by men with rifles behind steel fences.

Was the U.S. Navy interested in UFOs? Robert Snider told me that he had observed radar-equipped Navy planes in the Cape Girardeau area, one in particular that flew a north-south path once per hour.

In early 1974, I wrote to the Office of Naval Research in Washington, requesting an invitation to submit a proposal to secure funding for Project Identification. They wrote back that they would like my data and photographs: They were interested in atmospheric optical phenomena, and did not want to stimulate a proposal at the time, but an eventual grant from the ONR was not precluded.

Confrontation of military jets with UFOs continued into 1974. On June 20, late at night, Mike Toney and Harry Willson, Boy Scout directors at Cape Lewellen in Sam A. Baker State Park, and Gene Cook, a Camp Director and then superintendent of schools at Marquand, saw a white light traveling back and forth over Turkey Ridge. After the light had made about eight complete trips, two jets thundered into the area with only their landing lights showing. One jet arrived from the north and the other from the west, the latter coming around Logan's Mountain. As they converged on the moving

light, it stopped suddenly, and then became about three times brighter, with a corresponding increase in size. The jet pilots had apparently seen enough. Each made a 180° turn and left!

Anecdotes abound from others living in southeast Missouri who have observed jet-UFO chases—and an occasional UFO-jet chase. UFOs have been chased by jets in the St. Louis area, too. Many veteran radar operators have told me about tracking UFOs at speeds far exceeding that of fighter jets—and that was more than 20 years ago. Military guards at Army missile bases have told me of strange encounters, as have police and highway patrolmen from several states. Truckers and river barge men tell similar stories.

Could UFOs, as some persons think, be the product of an advanced technology? The earliest firsthand account in my files describes a wingless, silent craft that “flew” over two five-year-old boys playing on the bank of New York’s Hudson River—in 1905. This report follows by about eight years many reports of mystery airships seen in nineteen states throughout the nation during 1896 and part of 1897.¹⁸ Perusal of old newspaper files reveals phenomena that, in some cases, might now be categorized as UFOs. For example, in the “50 Years Ago” column of the *Wayne County Journal-Banner* is the news item: On July 12, 1928, four persons were returning from St. Louis by motor; “Quite a bit of excitement was caused Saturday night by the peculiar light in the sky, some believed it to be the end of time near at hand.”

The UFO phenomenon is worldwide and apparently dates from antiquity.¹⁹ Ufologists generally concede that the modern UFO era began on June 24, 1947, when Kenneth Arnold, flying a private aircraft near Mt. Rainier, Washington, saw “a chain of saucer-like things at least five miles long, swerving in and out of the high mountain peaks.” Media reports of the sighting made the public aware, and the flap was under way, spreading to other countries as well.²⁰

Some persons contend that the modern era began during the latter stages of World War II. During debriefings, American pilots described multicolored fireballs they nicknamed “foo fighters” to Air Force intelligence officers. Allied intelligence officers believed that the balls, which flew along with Allied aircraft, might be radar-controlled devices sent up by the Germans to foul ignition systems or to interfere with Allied radar. But after the war, it was learned that the German pilots had experienced the mysterious fireballs, too.²¹

Not restricted to the European theatre, the foo fighters plagued B-29 crews on bombing runs over Japan, and were sighted by Japanese pilots as well. According to General George S. Brown,

then secretary of defense, in a speech to the American Association for the Advancement of Science on October 16, 1973, foo fighters were seen also in both the Korean and Viet Nam conflicts.²² Discs and other objects besides foo fighters were reported in World War II. Professor Louis Sewell of the mathematics department at SEMO had two sightings as a navigator on a B-17 Flying Fortress. At midmorning on April 7 1945, Captain Sewell and his comrades were in nearly 1,000 aircraft over the North Sea on their way to a target near Berlin. Suddenly, out of the sun, a German fighter dived at Sewell's aircraft from the side, leveling off for a swift attack. It was quite a maneuver for a craft with no wings! Only a fuselage showed. Instead of firing, the object continued the familiar German fighter tactic of getting quickly away from the bomber formation in a rollout dive. Now a climb for altitude would be preparatory for another attack.

After diving out of range of the B-17's guns, the craft executed an impossible maneuver: it stopped! At that moment, Sewell was looking down on the object between his B-17 and the sea. Then, Sewell said, the object "darted up and out of sight at about two thousand miles per hour."

During the debriefing after the mission, Sewell told his story—as did his comrades on his B-17, as did flight crews from other B-17s who saw the object. Sewell's radio operator turned over several photographic exposures of the object to intelligence officers. No one from the crew ever learned of the disposition of the film, but that was SOP (standing operating procedure).

Like many of our Project sightings, here is an early case of imitation—a craft mimicking the attack procedure of a German fighter. Why was no attack made? Perhaps armament had not been added. Who would use an advanced technology for display purposes? Are many of the plasma-like balls of light we observe in the Project the same as the foo fighters of World War II?

Perhaps Intelligence was becoming inured to strange tales brought back by Allied airmen. Late in the war, for example, American fighter pilots, back from sorties over Europe, described an airplane without a propeller that flew faster than Allied fighters. They were seeing the new German Messerschmitt ME-262 jet fighter.²³ But jet aircraft had also been developed by Great Britain and the United States.²⁴

Less than three weeks after the war in Europe ended on May 7, 1945, Captain Sewell was a member of a courier squadron ferrying ground troops from the European theatre to the Pacific. Bomb-carrying B-17s had been modified to carry troops, up to 35 or 40

soldiers. With this lighter load, the B-17 had an airspeed of 180 miles per hour. The route was from Marseilles, France, on the Mediterranean Sea, to Casablanca in Morocco; then on to a port on the Atlantic Ocean near Dakar in West Africa. From there, the troops were flown to the Pacific.

On May 25, 1945, Sewell was in flight from Port Lyautey, Morocco to Dakar, Senegal, flying a southerly course in an early morning sun shining through intermittent clouds over the Atlantic. Several troops were in the nose section with Sewell. When they first saw the object, it was opposite the sun at their altitude and very shiny, "like aluminum." Sewell estimated the distance to the object as five to ten miles, because he could make out its shape, elliptical or disc. During the 8-hour flight, they saw it 6 or 7 times through the clouds. At times, it hovered!

In 1946, people in Sweden and Finland reported sightings of objects, dubbed "ghost rockets," close to the Soviet border.²⁵ Menzel wrote that the proximity of sightings near the Russian-controlled Peenemünde was disquieting.²⁶ Army intelligence sent General James A. Doolittle to Sweden to investigate the reports. It is worth noting that Sewell's first sighting was not far by air from Peenemünde.

Did the flying disc really originate in Germany? According to a private communication I received in 1977 from a technician who worked in "a completely new flightkorps, the Fliegande Scheibe [saucer]," Germany began research on flying discs in 1941. Of two models, the Habermohl-Schriever model was the simple saucer shape while the Miethe model, 45 meters (almost 150 feet) in diameter, was the classic double-convex shape. Photocopied photographs included with the correspondence, written in German, show both models having the familiar tricycle landing gear. According to the translation, on February 14, 1945, a Habermohl-Schriever model flew at 1,250 miles per hour after reaching an altitude of 7.5 miles in three minutes. Unfortunately, my informant refused to continue to correspond with me.

By 1979, the contents of his letter seemed to be substantiated by an article appearing in *Saga* magazine (July 1979) concerning UFO reports released from CIA files. Other literature concerning the German saucer program has surfaced, some sources suggesting that the United States and Russia captured certain scientists involved, and others suggesting that at the end of World War II the Nazis fled Germany to a base in Antarctica where they have continued to develop their technology.²⁷ Strangely enough, scientific expeditions to Antarctica have reported UFO sightings there.²⁸

While the suggestion of Nazi bases in Antarctica seems far fetched, the contents of the letter to me suggest a man-made source for UFOs. Although an unpopular hypothesis among ufologists, even with its inconsistencies, it is the most plausible. But who on earth controls such an advanced technology? The United States government? In my opinion, based upon conversation with servicemen and veterans, our military organizations now have very sophisticated vehicles, some of which are flying discs. Why hasn't the technology been made available? Where are UFOs kept? In Air Force hangars? Perhaps the answer to the last question is simple: there aren't that many UFOs on earth. Because of their high speed, they can appear in several places in a short period of time, inflating our impression of the number of participating UFOs. Perhaps the statement : "either they are man-made or they aren't" no longer applies. The UFO source may be a mixture of both.

In my opinion, the dynamic behavior of the lights and craft we observed indicates an advanced technology rather than an abrogation of the laws of physics. Perhaps modification or extenuation of some physical laws will be necessary. But I am concerned with the number of bizarre reports from sane, respectable persons, like that from a Bloomfield farmer. One day, out looking for his cows in a field, he suddenly encountered a landed disc. When he stepped back two paces, the disc was invisible; he could see trees beyond, in line with the disc's position. Two steps forward, and the disc was visible again. One doesn't need much imagination to think of the possibilities of such technology. In cases like these, it would be difficult for me to accept the objects as a creation of man.

No, UFOs do not behave according to prevailing technology, and the UFO intelligence does not behave as would a human visiting another planet. Surely the UFO intelligence has gathered all the flora and fauna of the earth, has deciphered all the languages, has determined all of man's technology, and has become cognizant of the world's religions; in short, they must know all there is to know about man. I believe that the UFO intelligence uses this information to mimic man and his technology.

I am reminded of the Air Force jet pilot who was to join with another military jet flying ahead and above. The pilot found a plane ahead and above, all right—a commercial jet airliner. Funny thing, he couldn't catch up with it. Surely, our nation's best and fastest fighter jets can fly faster than a commercial airliner!

A plethora of observational data, taken by naked eye, binoculars, and telescope, were recorded in the Project. Obviously, we

were very successful in obtaining photographic evidence for UFOs. In one case, a UFO registered a trail on infrared-sensitive film through an infrared filter. In addition, we obtained triangulation data indicating speeds from zero to 325 miles per hour. On one occasion, Sage and his crews picked up static on 37.1 MHz radios during a UFO sighting. A few minutes later, a panoramic frequency jamming signal in the range 39–190 MHz was detected by a spectrum analyzer. The color spectrum of a UFO, using an objective blazed diffraction grating, was recorded on color film.

Later the Project acquired field-portable, battery-powered instruments so that an engine-driven electric generator would not be needed. These instruments were sensitive magnetometers to measure a changing magnetic field (flux change), a sensitive gravimeter to measure a change in gravitational field intensity, a compact spectrum analyzer, and other electrical and optical devices. Because of infrequent trips into the field during the latter part of the decade, these instruments were installed at my office (Plates 35 and 36) and were never really brought to bear.

Additional sophisticated equipment is needed, including certain types of radar, as well as devices to record the intensity and spectrum of electromagnetic frequencies including the optical ranges such as infrared, visible, and ultraviolet ranges. The data should be scanned and stored in small computer devices. Most important, automatic tracking devices are needed so that the detectors can be locked on the direction to a moving UFO. Consequently, any signal emanating from a UFO could be continuously monitored.

Without doubt, our research has established that there is a UFO phenomenon, and we have conjectured about the nature of the intelligence behind the capricious UFOs. I suspect that their game is to gradually create general acceptance by repeated appearances. More UFO flaps will occur from location to location, winning "converts." More people will "believe in UFOs."

UFOs will come back to southeast Missouri again for another flap. I plan to be ready with more sophisticated instrumentation, adequate facilities, and sufficient technical help. If we are to learn their secrets, they must be studied scientifically—with instruments. When we understand them on a technical-scientific basis, when most of the world's inhabitants accept the reality of UFOs, then we will meet them face to face. And then will we know their mission.

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Appendix

SPEED OF A PHOTOGRAPHIC SYSTEM

The inherent speed of a lens-camera-film (photographic) system is related both to the speed of the lens and to the photographic speed of the film. The "speed" of a photographic emulsion is defined as the reciprocal of the exposure required to produce differing densities on the negative, resulting in an acceptable photographic image.¹ A particular type of emulsion is rated according to its ASA speed. An emulsion with an ASA rating of 400 is four times as fast as one rated 200.

On the other hand, the speed of a lens² is given in terms of its maximum aperture, say $f/1.4$, although the transmittance of the lens should be incorporated into the definition whence f -stops become T -stops.³ Here, the speed s will be defined as⁴ $s = BS/kN^2$

where

B = illuminance of the scene photographed;

S = ASA speed of the film emulsion;

k = a constant (includes transmission losses, etc.);

N = the f -number where $f = ND$;

f = the focal length of the lens; and

D = diameter of the aperture.

Because the object is moving, its image moves across the film plane at a rate proportional to the focal length of the camera lens. Hence, the speed of the system is proportional to D^2/f and not to D^2/f^2 , the square of the aperture ratio.⁵ The revised definition of speed becomes $s' = BSf/k'N^2$ where k' is a revised constant.

The properties of three Project photographic systems are given below.

To effect the analysis of UFO photographs, a calculation of s' was not necessary, because only a comparison of photographic systems was needed. Hence, a dimensionless quantity called "relative speed" was obtained by taking the ratios of speeds s' in order that all constant or unknown factors such as B and k' cancelled. Strictly, B should not be called the illuminance; more appropriately, it could be called the brightness of the light in the sky. Also, k' is assumed to differ little among the photographic systems used in the Project in order that it can be cancelled when taking ratios.

Properties of Three Photographic Systems

Property	50 mm	800 mm	Polaroid
f focal length	50 mm	800 mm	114 mm
D aperture diameter	3.5 cm	10.3 cm	1.3 cm
N minimum f-number	1.4	8.0	8.8
S ASA emulsion speed	800*	800*	3000
film designation	Tri-X	Tri-X	Type 107
film type	b & w	b & w	b & w
relative speed**	4.4	2.3	1.0

*The Kodak Tri-X was "pushed" from ASA 400 to ASA 800 by developing in Kodak D-76 developer at 72° F rather than 68° F.

**Here, the "relative speed" of the Polaroid system is arbitrarily set equal to unity.

The relative speed of the 800 mm system for the May 18, 1973, Piedmont sighting was 2.3 times that of the Polaroid system, while the relative speed of the 50 mm system was twice that of the 800 mm system for the May 24, 1973, Farmington sightings.

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WHAT IS PROJECT IDENTIFICATION?

Project Identification consists of a team of professionally qualified, highly-trained researchers—headed by Harley Rutledge, Ph.D.—whose main objective is to investigate UFOs *while the phenomena are in progress*. The use of highly scientific instrumentation—Questar telescope (whose magnifying power can be changed without replacing the eyepiece), high-quality camera equipment, electromagnetic frequency analyzer, and high-frequency, low-intensity sound detectors—enables the team to calculate the UFOs' *actual* velocity, distance, and size, as well as provide remarkable photographs of the real thing!

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